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All communications for publication or in reference thereto should be addressed to Prof. Roscoe R. Bell, Seventh Ave. & Union St., Borough of Brooklyn, New York City.

EDITORIAL.

EUROPEAN CHRONICLES.

DOG DISTEMPER—SUCCESSFUL VACCINATION IN EXPERIMENTAL INFECTION.—This news will be received by all who are lovers of dogs, as well as by veterinarians and bacteriologists, if instead of its successes with animals experimentally infected, it should prove as advantageous in protecting dogs from natural infection, from contagion.

This is what Dr. Physalix, of the Museum d'Histoire Naturelle, has proposed to demonstrate to the Société Pratique de Médecine Vétérinaire, by making a number of experiments before a commission elected from its members. The experiments are now going on.

The researches made by Dr. Physalix are, so to speak, secondary to a work of Director Lignières, the *hæmorrhagic septicæmias*, where he described the microbe which he found in the organism of dogs affected with distemper. This microbe is a bacillus, quite long, which grows in peptone bouillon without clouding it, and forms small masses which collect at the bottom of the tube.

Mr. Physalix has taken up the same subject and has succeeded in isolating this specific microbe described by Lignières. Inoculated in the veins, according to the dose and virulency, it kills rapidly in a length of time between five and ten hours, with symptoms of bulbar toxication, or again gives rise to an

infection which develops slowly and may assume various forms. In the cases of rapid death, the symptoms and lesions are due to the solubility of the virus; the microbe has not proliferated and blood cultures remain often sterile.

In peptone cultures the virus becomes gradually attenuated with age. To get back its original virulency it must pass again through the organism of the guinea-pig or of the dog.

Attenuated cultures have been used by Dr. Physalix to vaccinate young dogs against the disease, in inoculating them, under the skin of the thigh, with two or three cc. of culture. He first began by a very weak culture, whose local action is insignificant; this is the first vaccine. The following inoculations are made with cultures of increasing virulency and are renewed three or four times. Thus prepared, dogs can be tested with intravenous injections of a virulent culture or by *cohabitation with infected dogs*. Dr. Physalix has had vaccinated dogs which have lived three months in daily contact with sick animals, several even in the same kennel. Others have had their nasal mucous membrane covered with pathological mucosities from sick dogs and were not contaminated. Finally, vaccinated dogs have been tested by intravenous injections and have resisted, while witnesses died or became very sick.

For Dr. P. the problem of the vaccination against dog distemper is resolved, and yet there seems to be some hesitation on the part of the profession to accept his views.

Of course the method is new. Several injections are required to give immunity, etc., etc.; but if the principle is true, it is worth while to work at it, and it is for that reason that a committee of practical men has been appointed. The experiments are already under way; they were interrupted by the summer vacation, but as soon as they are resumed and the results are known, the readers of the REVIEW will know it.

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HUMAN TUBERCULOSIS IS TRANSMISSIBLE TO BOVINES.—We must not be surprised if the subject of tuberculosis, under all forms, for some time to come, is found to fill the pages of

scientific papers. The bomb delivered by Prof. Koch, although not loaded with dynamite, has exploded, and with such loud detonation that it has awakened all medical scientists for and against the subject. Experiments have been started all over, and before a long time has elapsed crushing evidences will be forthcoming to show that Prof. Koch has made a mistake—or, rather, that he has misinterpreted the results of his own experiments.

It has been my good luck lately to see cattle which are now subjects of experiments, and also to examine lesions taken from animals killed experimentally. So far the evidences are very satisfactory. Healthy young animals have in a comparatively short time shown unmistakable symptoms of tuberculosis; others at their post-mortem revealed positive lesions, whose tuberculous nature were readily demonstrated by the microscope and by cultures. That human and bovine tuberculosis are identical seems to have still numerous advocates, and it certainly will be difficult to ignore and deny the experiments of Chauveau, Klebs, Kitt, Bollinger, Crookshank, and many others, even by taking into consideration the interesting results obtained by Theobald Smith, of Washington, and Frothingham, although they were different from those obtained by Prof. Thomassen, of Utrecht, and which he has related in the paper he read at the Congress of London, where he made the important conclusions that from his own experiments it is *difficult* but not impossible to give bovines a generalized tuberculosis with pure cultures of bacilli from human source; but nevertheless the identity of tuberculosis in the two species remains an unshaken truth.

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PYÆMIA OF COLTS.—We are not aware that this affection is common in the States, and, yet, although governmental breeding stations do not exist with us, there are private farms where the conditions for the development of pyæmic arthritis or paresia of colts may exist. The subject has received in Germany closer attention and given occasions for researches, among which I find those of the chief veterinarian of the haras of Wurtem-

berg, Mr. Schule. For him all the various forms of the affection are of one morbid nature. It is a specific disease given by the dams to the offsprings before delivery; after birth, by contagion of the umbilical cord, the soiled litters; stallions can also propagate by successive coition from one mare to another. This idea, which is not new, explains the epizootic and enzootic character of the disease, and specially the injurious part played by some mares. The disease is due to a specific microbe which is found in the articular and tendinous synovial bursæ, in the blood of the colts, and also the uterine discharges of the infected mothers.

Under the microscope it appears under the shape of an immobile micrococcus, provided with a clear translucid capsule. Disposed as diplococcus most frequently, it is not rare to see them in groups of three or four.

From the series of observations and experiments that are described by Mr. Schule he concludes that four principal indications present themselves: (1) Treatment of the suspicious or infected mares, by minute hygiene of the dam, disinfection of the place where delivery has taken place, intra-uterine injections of lysol after parturition. This treatment lasts more or less whether it is applied on mares which have delivered normally or have aborted. (2) Special care of the stables, in the shape of thorough cleanliness and disinfection. (3) Antiseptic care of the umbilical cord of the new born—sterilized ligature to the cord, sublimated solution washing, with sterilized wadding over the umbilical region, the whole renewed as the case may be. (4) Disinfection of the penis of stallions after every suspicious mounting, a condition which can always be admitted when in regions where the disease exists.

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A FUND FOR SCIENTIFIC RESEARCHES.—A very interesting law has just been passed in France creating a sinking fund for scientific researches, divided in two sections, with the object of promoting the investigations relating to (1) the discovery of new methods of treatment of diseases affecting mankind, domes-

tic animal and cultivated plants, and (2) to the discovery (outside of medical science) of the laws which rule the phenomena of nature (mathematics, mechanics, natural history, physics, and chemistry).

The resources of the fund are to consist: (1) In grants from the state, the department, cities and other public establishments, (2) in private donations and legacies, (3) individual or collective subscriptions, (4) on premiums from the funds of the racing institutions (*pari mutual*) fixed by the Secretary of Agriculture. The object of the law is to promote private individual investigations, to assist them and at the same time to allay the enormous expenses which official researches might impose on the public. The board of administration of the fund is to consist of a commission composed of members well known for their special interest in the various scientific directions.

Much advantage is expected to be derived from the new law and the assistance it may offer to all investigators. A. L.

FINDING ITS LEVEL.

The automobile seems to be fast terminating its short but tempestuous career as a passing fancy in America. In New York City it is becoming a rare sight to observe one of the hundreds which used to bubble along upper Broadway, ringing bells, and frightening horses and pedestrians. The company which operated so many electric cabs is in the hands of a receiver, who has withdrawn most all of the vehicles from the streets, and the only ones which may now be seen are a few operated at great expense by business houses for the purpose of advertisement, and those run by individuals as a fad, either for alleged pleasure riding or for sport. For the purpose of affording enjoyment as a pleasure vehicle we fancy that their life is doomed to early curtailment, as the record of accidents is becoming so long that many have lost faith in them. The distressing accident by which Mr. Frederic H. Benedict lost his life near West Point, N. Y., on October 19, and Mr. Grenville Kane made so narrow an escape from the same fate, shocked every one who read of it.

A similar accident, with less fatality, occurred at Yonkers the day following that at West Point, whereby William Walters and family were thrown violently in all directions from their runaway machine, which clashed into a fence, and then tumbled over on its side, and on the next day a gasmobile blew up, the chauffeur being found an hour afterward in a mangled condition with the *débris* of his machine in promiscuous disorder around him. In the meantime, the horse advances in value and in esteem.

WE are pleased to note that the San Francisco Veterinary College, which maintains a summer course of six months, has raised its requirements for graduation to three such terms.

THE prices obtained by Tichener & Co., of Chicago, at their first New York autumn sale, last month, broke all records for heavy harness horses. Forty-four head averaged about \$1300 each.

THE logical reasoning by which Dr. Robert W. Ellis, in his contribution to this month's "Reports of Cases," arrives at the cause of the accidental tenotomy in his patient, stamps him as the Sherlock Holmes of veterinary medicine.

THE American veterinary schools opened their sessions last month with greatly enlarged classes. The Chicago colleges have a veritable boom in the matter of attendance, while the New York schools, with their high matriculant standards, have a large increase in the number of students.

IT is stated by a South African correspondent that the British Army horses in that country are dying at the rate of 10,000 a month—by disease, privation, and accident. In the meantime, America is supplying this terrible decimation almost entirely, about 9000 animals embarking from New Orleans monthly for the dark continent.

WHILE no criticism will be forthcoming from the veterinary profession upon the marked discrepancies between the ante- and post-mortem statements of the injuries caused by the assassin's bullet as it ploughed through the body of our beloved President, as well as the prognoses which the bulletins uttered up to a day or two prior to death, we cannot help thinking how the veterinarian would have been treated by the press had he similarly erred in a case of national moment.

It now appears that the action of the American Veterinary Medical Association, in expelling a member without giving him the opportunity of defending himself against the charges, was illegal. What is the value of hasty, passionate action? American laws would have been shorn of their dignity and the Constitution would have been outraged if the President's assassin had been condemned to death without a trial by jury. If the object of the association's vengeance did that which it considered wrong, the situation was not improved by duplicating his act.

THE October issue of the *Journal of Comparative Medicine and Veterinary Archives* characterizes the action of the New York State V. M. Society, in the matter of the charges against its late Secretary, as "*contemptible*." We wonder if our contemporary isn't allowing its wishes to run away with its judgment. The association took deliberate action after thorough discussion, and we fancy its sense of justice will bear closer legal scrutiny than that of the A. V. M. A., which permitted some of its impulsive members to sway its action from its usual conservative course. The same spirit, and many of the same men, caused the U. S. V. M. A. to go on record at the Buffalo meeting in 1896 in a ridiculous set of resolutions upon the subject of tuberculosis, while at Atlantic City the same subject was treated with gloves on. Nothing can be gained by precipitation. When a stand is taken let there be such a foundation of principle and proof that nothing can shake it.

ORIGINAL ARTICLES.

TRANSMISSION OF TUBERCULOSIS THROUGH MEAT AND MILK.

BY JOHN J. REPP, V.M.D., AMES, IOWA.

*Professor of Pathology and Therapeutics, and Veterinarian to the Experiment
Station, Iowa State College.*

With the classical experiments of Villemin and Chauveau, made over thirty years ago, the belief arose among the leading students of the subject of tuberculosis that this disease of the various species of mammalian animals is the same as tuberculosis of the human species and that it is capable of transmission among all of these species. The discovery of the germ of tuberculosis caused many more, including the discoverer, Koch, to adopt this belief, although Koch tells us he did so with reserve; and, moreover, to refer the causation of the disease in all the species above mentioned to the same tubercle bacillus. This opinion met with ready and almost universal acceptance up to the last three or four years. During this time the question of the identity of the tubercle bacillus as found in animals and in man and the transmissibility of tuberculosis among these species has been brought under considerable debate, not only by the laity but by scientists as well, and work has been done by investigators with a view to arriving at some definite and thoroughly defensible conclusion.

A few scientific men have recently expressed themselves in such a way as to lead one to infer that they incline to the opinion that the tubercle bacillus as found in man is radically different from that found in cattle and that tuberculosis is not transmissible from cattle to man. None, however, have by their statements attracted so much attention as did Professor Robert Koch of Berlin at the British Congress on Tuberculosis held recently in London, England. Professor Koch there expressed the belief that tuberculosis in man is different from tuberculosis in cattle and cannot be transferred to cattle; and, from another considera

tion, that cattle tuberculosis is most likely not transferable to man to any appreciable extent. More will be said in regard to Professor Koch's view of this subject later in this article.

On account of the revival of this important consideration and the bearing it has upon sanitation, it is highly desirable that a careful statement of the facts of the case should be made and that any warrantable conclusions be adduced therefrom. This discussion will be confined to the limits indicated by the title set forth, and only the meat and the milk of the bovine species will be considered.

For the sake of clearness the subject may be treated under two general subdivisions, viz.: (1) Transmission to Animals, and (2) Transmission to Man.

I.—TRANSMISSION TO ANIMALS.

A. By Meat.

The portions of the body not commonly used for food, such as the brain, large lymphatic glands, spleen, bladder, uterus, lungs, testicles, mammary gland, skin, shall be excluded. The tongue, muscles, small intermuscular lymphatic glands, digestive tube, heart, liver and kidneys are included.

No reference will be made to experiments in which the material inoculated or fed is not such as we have chosen to consider, or in which the character of material is not stated, of which classes there are a great many experiments which by their positive results demonstrate that tuberculosis can be transmitted from animal to animal of the same or of a different species.

1. By Artificial Methods.

Arloing¹ inoculated the muscle juice of ten tuberculous cows into guinea-pigs, and the result showed that the muscle juice of two of the cows was infective, 3 out of 10 guinea-pigs, 30 per cent., inoculated from these two cows becoming tuberculous.

Galtier² infected two rabbits with the juice of the flesh of a tuberculous cow.

Nocard³ produced tuberculosis in 1 case out of 21, 5 per

cent., by injecting juice of the flesh of 21 cows condemned at the abattoirs on account of tuberculosis.

Woodhead⁴ produced tuberculosis by injecting into the peritoneal cavity of two rabbits the raw juice from the intercostal muscles of a tuberculous cow, after the tuberculous pleura had been stripped off.

Veyssière and Humbert⁵ inoculated two rabbits with 1 cc. of flesh juice from a tuberculous cow in very good condition, and both became tuberculous, 100 per cent.

2. *By Natural Methods.*

Johne⁶ fed 35 animals with the raw flesh from animals attacked with tuberculosis, and 8, or 22.5 per cent., became tuberculous.

Gerlach⁷ fed 46 subjects in the same manner, and 6, or 13.1 per cent., contracted the disease.

Peuch⁸ caused 2 young pigs to consume 5 pounds of raw flesh, without bone, in 10 days, and in 2 and 3 months, respectively, these animals presented discrete glandular tuberculosis, 100 per cent.

Nocard⁹ failed to produce tuberculosis in any of several litters of kittens, which he fed with meat of cattle condemned on account of tuberculosis.

Perroncito¹⁰ had like negative results in case of 18 young pigs, fed from three to five months on the flesh of condemned cattle.

Galtier¹¹ reports that a calf, aged six weeks, ate in one month, four kilograms of raw meat taken from cows which had been seized on account of generalized tuberculosis; another calf, aged four or five months, also ate at three different times large quantities of raw tuberculous meat; two pigs, aged five to six months, ate considerable quantities of condemned meat. None of these animals developed tuberculosis. It is noteworthy that the presence of tubercle bacilli in some of this meat had been proven by inoculation of rabbits with its juice.

In speaking of the transmission of tuberculosis to animals through meat, we must not lose sight of the fact that, in the

process of removal of the tubercular organs not ordinarily used as food, and which are for this reason not considered here, and in the cutting up of the carcass, some of the food parts of the carcass may be smeared with material rich in tubercle bacilli. Such contaminated meat would, of course, be much more highly infectious. It is also to be noted that the muscles of swine and their intermuscular lymph glands are more apt to be tuberculous than is the case with similar bovine structures. An examination of the literature to which I have had access, indicates that but very little experimentation has been done to determine the infectiousness of those organs and tissues of tuberculous animals which are used for food. Much experimentation has been done with tissues other than food tissues, but chiefly for the purpose of determining the general infectiousness of the disease. If these experiments with the food tissues should be extended, there is no reason to doubt that they would indicate that this is a more extensive source of infection than is at present apparent. Also, none of the experiments cited, nor any other, so far as I can learn, have been made with the liver as the object fed. German slaughter house statistics¹² collected during 1888 and 1889, show that in all tuberculous cattle examined the liver showed the disease in 28 per cent. of cases. If a series of experiments were made by feeding this organ, a much higher rate of infection would be observed. It will be noted that this is classed as a food organ.

The experiments referred to nearly all have to do with the meat of *highly* tuberculous cattle. In these cases it is quite probable that the tubercle bacillus was carried into the muscular system through the blood vascular system, it being a well-recognized fact that in generalized tuberculosis the blood contains the microorganisms of the disease. It is quite unlikely that the food organs and tissues in mild, localized cases would contain the bacillus, unless it might be the liver, with a possible rare occurrence in some of the other organs or tissues under consideration. The food organs or tissues of these mild cases ought not to be found infectious unless contaminated from non-

food organs or tissues in slaughtering or dressing. We have no evidence to show that the food parts of these mild, localized cases would be unsafe for food purposes if the non-food organs and tissues and all tuberculous food tissues were removed at the time of slaughter, provided that no contamination by smearing would take place.

It is well known that heating to a temperature of 158° F. and maintaining the temperature at this point for 15 minutes will devitalize the tubercle bacillus. With this in view we are led to say that thorough cooking will render inert any tubercle bacilli which may be in any way connected with a piece of meat. But the cooking must be so thorough as to subject the interior of the piece of meat to this heat for this length of time. Tous-saint³ found broiled steak infected after heating its interior to 176° F. It is presumed that he did not maintain this heat long enough. Woodhead¹⁴ found that rolls of meat weighing over 4 pounds which he had smeared with tuberculous matter were not sterilized by ordinary roasting and boiling.

Johne¹⁵ in 62 experiments administered notoriously tuberculous flesh after it had been submitted to cooking in boiling water for ten to fifteen minutes, and 35.5 per cent. of the animals became affected.

B. By Milk.

This will be understood to mean milk and all of its products, as: skim milk, buttermilk, cream, butter and cheese. The right is reserved to refer to any of these products as milk. The number of experiments and observations showing that tuberculosis may be transmitted from animal to animal of the same or different species through the medium of the milk of tuberculous cows is very great. In order to reinforce the assertion by the facts in the case a number of experiments and observations will be presented.

1. By Artificial Methods.

There is no attempt made in the following presentation to separate the experiments made with milk of cows with healthy udders from those made with the milk of cows with diseased

udders, but attention is invited to the fact that the milk of cows with healthy udders is in a large number of cases infectious for animals.

Ernst¹⁶ reports that out of 88 guinea-pigs inoculated from 15 cows, 12, 13.6 per cent. became tuberculous; of 90 rabbits, 6, 6.6 per cent. became tuberculous.

Hirshberger¹⁷ produced tuberculosis in 14 out of a number of rabbits inoculated with the milk of 29 tuberculous cows with sound udders.

Bang¹⁸ by inoculation of guinea-pigs and rabbits found the milk of 9 out of 63 cows with apparently healthy udders infectious. On microscopic examination post-mortem 3 of these cows showed slight udder lesions.

Peuch¹⁹ produced tuberculosis in all four rabbits inoculated from the milk of a cow with tuberculous udder. A two-month-old pig fed five days with $4\frac{1}{2}$ quarts of milk from the same udder did not show any lesions of tuberculosis when killed 56 days later.

Ravenel²⁰ experimented as follows: Five grade cows which did not show udder infection were selected and 10 cc. of the milk of each was at different times inoculated into the peritoneal cavity of 88 guinea-pigs, of which 11, 12.5 per cent., became tuberculous. No preparation of the milk was made, but it was taken just as it came from the cow. In another series of 52 guinea-pigs given the whole unprepared milk of the entire herd of 5 cows no tuberculosis developed.

Russell²¹ inoculated 17 guinea-pigs with 0.5 cc. to 4.0 cc. of milk of 7 different tuberculous cows, only 1 of which showed tuberculosis of the udder. The 2, 11.8 per cent., of these 17 guinea-pigs which were inoculated with the milk of the cow with tuberculous udder developed well-marked tuberculosis, although only 2.0 cc. and 1.0 cc., respectively, of milk was used.

Delepine²² injected the sediment obtained by centrifugation of samples of country and town dairies into the subcutaneous tissues or the peritoneal cavity of 65 guinea-pigs and produced tuberculosis in 1 of them, 0.15 per cent.

Schroeder²³ inoculated 40 guinea-pigs with the sediment resulting from centrifugalizing 19 samples of dairy and dealers' milk. Four died of intercurrent disease, and out of the 36 remaining 1 developed tuberculosis, 0.28 per cent. Nothing is known of the cows from which the milk was obtained. In another series 32 guinea-pigs were inoculated intraperitoneally with centrifugalized milk of 15 cows either known to be tuberculous or which gave a tuberculin reaction. Of these 1 developed tuberculosis, 0.3 per cent. In still another series the centrifugalized or untreated milk of 4 cows whose udders were not diseased was injected into 16 guinea-pigs, each receiving intraperitoneally 5 doses on as many different dates. None of them developed tuberculosis.

Bollinger²⁴ produced tuberculosis in experimental animals with the milk of a cow with non-tuberculous udder.

May²⁵ injected the milk of 6 cows, 1 of which had a tuberculous udder, and found the milk of the tuberculous udder infectious.

Stein²⁶ obtained by the same method 4 positive results out of 14 injections with milk from sound udders, 28.57 per cent.

Nocard²⁷ inoculated the milk of 54 cows and obtained infection with 3 which had diseased udders.

Kanthack and Sladen,²⁸ in examining 16 sources of the milk supply to the colleges in Cambridge, England, inoculated 90 guinea-pigs with the result that 23, or 25.55 per cent., died of tuberculosis. Of these 23, 13 were inoculated from the creamy layer and 10 from the sediment. Of the 16 dairies examined 9 were infectious, 56.25 per cent.

The Director of the Jenner Institute of Preventive Medicine²⁹ found by animal inoculation that the milk of 17 out of 100 samples was able to produce tuberculosis, 17 per cent.

Adami³⁰ reports that he and Martin, in inoculating the milk from 10 tuberculous cows whose udders were free from tuberculosis, produced tuberculosis in 2 guinea-pigs out of 29 guinea-pigs and 26 rabbits inoculated intraperitoneally, 3.6 per cent. A calf fed 5 months with the milk of the cow that pro-

duced the disease in these 2 guinea-pigs did not develop the disease.

The work of Rabinowitch and Kempner³¹ is very interesting as adding strong evidence to that already obtained of infectiousness of milk of tuberculous cows, even though the udder be sound. The experimenters used the milk of 15 cows which had reacted to the tuberculin test, in 10 of which the milk was found by inoculation of guinea-pigs to be infectious, 66 $\frac{2}{3}$ per cent. Of the 10 cows 1 showed clinical evidence of udder tuberculosis and another showed it on microscopic examination post-mortem. Two other cows were only slightly affected as determined by clinical examination, and still two others showed no symptoms of the disease. The inoculations were made into the peritoneal cavity with a combination of the sediment, obtained by centrifuging, and the fat layer. Butter was made from the milk of 1 of these 10 cows, and by inoculating guinea-pigs with it tuberculosis was set up in 3 out of 4 guinea-pigs inoculated, 75 per cent.

Obermüller³² reports that Brusafferro has obtained positive results with 9 samples of butter; Bang from 1 specimen from a tuberculous cow; Roth from 2 out of 20 samples from diseased cows and from the market. He also reports that as a result of his own experiments he succeeded in producing tuberculosis in 4 out of 41 guinea-pigs inoculated from 10 different samples of butter.

Hormann and Morgenroth³³ examined 10 samples of butter, using the method of intraperitoneal inoculation of guinea-pigs. The samples contained true tubercle bacilli as proven both by lesions produced and by cultures.

2. By Natural Methods.

Gerlach³⁴ fed young animals, calves, pigs, rabbits, etc., with milk taken from tuberculous cows, and found that some of them grew thin and died at the end of a few months, showing at the autopsy an intense tubercular infection of the organs of the abdominal cavity.

Bang³⁵ reports autopsy on 34 milk-fed calves, 24, 70.6 per

cent. of which showed lesions of tuberculosis evidently produced by the ingestion of milk containing tubercle bacilli. Since then this author has made numerous similar observations.³⁶

Law³⁷ fed 3 calves of healthy parents on the milk of 3 tuberculous cows with apparently sound udders with the result of producing tuberculosis in all 3 calves, 100 per cent.

Ernst³⁸ fed 21 healthy calves on milk of tuberculous cows with healthy udders and 8, 38 per cent., of them became tuberculous.

Ernst³⁹ fed 48 rabbits from one to three months on the milk of healthy udders, and 2, 4.1 per cent., were infected with tuberculosis.

Freudenreich⁴⁰ examined 28 samples of mixed milk, and of this number found 4 which proved to be virulent when inoculated into guinea-pigs.

Bang⁴¹ says: "In Denmark, the swine are almost always fed with skim milk, buttermilk, and whey, in addition to grain, and formerly it was noticed that when these milk foods were given raw the swine almost always suffered from tuberculosis, where this disease was prevalent among cows. Since attention has been directed to this danger tuberculosis in swine has greatly diminished in my country."

Hills and Rich⁴² record the observation made by one of them that 5 swine, born of apparently healthy parents, and fed on skim milk from a creamery partly supplied by tuberculous cows, were found tuberculous on autopsy. Also that many of the pigs fed on the milk of a herd of 91 cattle, 78 of which were tuberculous, were found tuberculous on post-mortem examination.

Russell⁴³ fed 2 pigs, beginning at six weeks of age, from August 23 to November 10, on separator slime received from the college creamery. None of them became tuberculous.

Bang⁴⁴ says: "In Denmark milk is often given to young or to sick horses, and in those parts of the country where this custom is frequent, tuberculosis is not rare in the horse."

McFadyean⁴⁵ says: "In a considerable proportion of cases there was a distinct history of the animal's having been fed with tuberculous milk. Now when one reflects that certainly not one horse in several hundreds is at any period of its life fed on cow's milk, the frequency with which tuberculosis has been met with in horses that had been so fed becomes very striking."

The foregoing states briefly most of what has been carefully done and recorded by way of experimentation and observation to prove that tuberculosis is communicable to other animals through the medium of the milk and the food tissues and organs of tuberculous neat cattle. In addition there might be added other observations of less definite shape, but no less true and convincing, as, for example, the great lessening of tuberculosis among calves of tuberculous dams which are separated at birth and fed on sterilized milk or the milk of sound cows, as has been so abundantly shown by Bang in the prosecution of his suppressive measures in Denmark. Reference might also be made to numerous observations of veterinarians pointing to the transmission of tuberculosis from tuberculous cows through their milk to calves and swine. Enough has been done to prove beyond the peradventure of a doubt that tuberculosis may be transmitted through the milk and the food structures of tuberculous animals to the animals that consume these products or are inoculated with them. Upon this all students of the subject agree. This much has been proven. But these facts do not decide the important question at issue, viz.: whether or not tuberculosis is transmissible from animal to man, nor would they if they were multiplied *ad infinitum*. They only furnish a basis from which we may reason. For this purpose they are invaluable, as they establish the premise that the meat and milk of animals do at times contain living, virulent tubercle bacilli, capable of producing disease in other animals.

II.—TRANSMISSION TO MAN.

A. By Meat.

1. By Artificial Methods.

There is no evidence of any sort on this point.

2. By Natural Methods.

The evidence on this score is only presumptive. However, it is well known that since ancient times legislation and sanitary regulations have been moulded around the presumption that the meat of highly tuberculous animals is dangerous as human food on account of the risk of conveying the disease to man through this medium. At this time every civilized nation that has any legislation or sanitary regulations in regard to the meat of tuberculous animals provides that such meat shall either be condemned or that it shall be sold under declaration. These laws and regulations are based upon the analogy between tuberculosis in animals and the same disease in man and the fact of the intertransmissibility of this disease among the various species of animals. Whether this evidence warrants such restriction on the use of meat or not, has not yet been positively demonstrated, and on account of the impracticability of direct experiment with human beings we will almost certainly never be able to make such demonstration. The question must be decided upon the evidence we already have, and upon the additional evidence of the same character which from time to time may be added.

Of course, cooking of meats as it is usually practiced effectually disposes of most of such danger as would exist if meat were eaten raw and without any attempt at sterilization. On the other hand, there is not one whit of evidence that tuberculosis is not to some extent transmitted from animal to man through ingestion of meat. All the evidence we have indicates that such transmission occurs to a limited extent.

(To be continued.)

THE LEGISLATURE OF TEXAS has just appropriated \$51,000 to erect a chemical and veterinary laboratory at the State Agricultural and Mechanical College. Dr. M. Francis is in charge of the Department of Veterinary Science. We have every reason to feel satisfied with the progress being made at the beginning of the twentieth century, especially in the Western section of this continent.

MYOTIC DERMATITIS.

BY COLEMAN NOCKOLDS, 1ST CLASS VET., 1ST CAVALRY, BATANGAS, PHILIPPINES.

One of the bugbears of the life of American army horses and mules, as well as soldiers in the Philippines, is a troublesome complaint known throughout the width and breadth of the land as "adobe itch." Everything that is not of the same quality and value as its analogy in the United States is spoken of out here as "adobe;" for instance, the Mexican dollar, the mud-like stones and brick of which some of the houses are built; in fact, anything that is not the real material, and which takes the place of the genuine article, is "adobe." In the case of this troublesome skin lesion "adobe," in one sense of the word, is a misnomer, as we find out by experience, both amongst animals and ourselves, for once "adobe" lays claim to its victim, whether person or animal, it amounts to the same thing, viz., that they have run up against the real thing, and there is not the slightest doubt about it. "Adobe itch" is really a demonstration of the amount of torture and the changes which can take place in the skin of either man or animal as a result of the workings of a vegetable parasite in a country where atmospheric conditions and the nature of the soil all tend towards its full development, and allows it to live and thrive to the fullest extent of its parasitic existence.

"Adobe itch" is a contagious cutaneous affection caused by one or more species of fungi belonging to the genus *Trichophyton*, and most probably also one of the genus *Sepidophyton*, so it is really "adobe," and not true "itch," which, as is well known, is caused by various tribes of the Acarina, the most prominent of which is the *Sarcoptinæ*, which causes most of the itches of man and animals.

These fungi consist of filaments and spores; the filaments are tubular, one tube being made up of several sections joined end to end, some of which contain oval-shaped spores. These spores eventually become changed into tubes. The tubes are

found chiefly beneath the crusts which are seen at the site affected, whilst the spores are generally found on the surface of the integument and in the hairs.

This very intense form of ringworm seems to be confined to tropical regions, especially those of the Eastern Hemisphere, and east of Africa, in countries where the air is moist and humid. It does not exist to any great extent in countries where the air is dry.

Every veterinarian is familiar with the appearance of the common form of ringworm, as it is seen in the States, and the symptoms are very similar here, with the exception that instead of being confined to one or two isolated patches, the skin of the animal becomes literally covered; there is present various little circular bare patches, surrounded by elevated zones, which is so characteristic of the raids of tinea; large portions of the skin of the affected horse are completely denuded of hair, and covered with scabby and scaly centres. If it were not for the occasional appearance of the characteristic circles, one might be led to suspect some other kind of skin lesion. Usually the side of the face, behind the ears and the neck are attacked first; later the shoulder and flanks become involved. As the disease advances the animal becomes a pitiful sight. The circles become confluent; often there is a discharge of a dirty colored fluid from the elevations, and ulcerations occur. The characteristic circles vary in size from that of a quarter to a dollar; the hair within them is erect and broken; their centres are slightly elevated, due to a purulent exudation under the integument. Most of the affected area is covered with little elevations, on which are dull, dead looking hairs, with a gummy substance at their base and which later discharge a small quantity of sticky material, which dries and forms scales. The skin thickens, giving it a peculiar appearance; sometimes large ulcerated patches occur. The animal bites and rubs itself. Occasionally the lesions are confined entirely to the heels and coronet, in which case the skin covering those parts becomes thickened and scabby and raw. A horse may become covered with "adobe" in a few hours or as

many days; its tendency is to spread indefinitely; there is no inclination to heal spontaneously, as it is said to be the case in ordinary *tinea tonsurans*. There are no constitutional symptoms as a rule, except that an animal loses flesh, and in rare cases there is a slight rise of temperature. The disease is transmitted from one animal to another by actual contact, through the agency of families, rubbing against posts, grooming utensils, etc. Once in a troop or other bunches of horses it spreads very rapidly from one animal to another.

The correct method of diagnosing the disease is, of course, the microscope. The only trouble it is liable to be confounded with is favus, in which disease the circles are concave in the centre, whilst in "adobe" the circles are convex in their centres, due to the accumulation of fluid under the integument. The appearance of the hair is rougher and more broken in "adobe" than in favus.

In man "adobe" is generally first noticed in the inguinal region or on the scrotum in the form of an erythema, with well marked raised rings; under the raised portions is a watery fluid. There is always an intense itching present, which is worse at night; those parts of the body covered by hair are generally avoided by the parasite. The soles of the feet are often attacked, especially in those that go barefooted, as is often the case whilst bathing. After man, the animals most commonly attacked are the ox, horse, monkey, dog, cat, mice, rats, sheep and pigs. Goats, which are plentiful everywhere in these islands, are apparently immune. Of course the ideal victim is the Filipino, no doubt because of the exceedingly filthy conditions under which he exists.

The fungi, which are the cause of "adobe," like the *Muscounæ*, to which they are related, live on decomposing animal and vegetable matter, and exist wherever such matter is found, provided the climatic conditions are favorable. Horses come in contact with it whilst lying on the ground or rolling, or even walking, especially when the ground is muddy; they also become infected whilst crossing streams, travelling in districts

where long grass, weeds and brush are plentiful; it is most prevalent during rainy months, but exists to a more or less extent during all of the year. The most common way in which man becomes infected is said to be through clothes which the natives wash in water which has not been boiled. Often it is transmitted from horses to man and *vice versa*. It can be transmitted from one species of animal to another by actual contact of families. There is nothing of importance to be noticed as predisposing causes except rainy weather, and animals at all ages and under all conditions are liable to be attacked. Although this disease was mentioned by the older veterinary writers as a vice, developed under the influence of physiological misery and uncleanness of the body and filthy dwellings and stables (it is quite possible that it originated amongst Filipino natives), the parasitic nature of ringworm was demonstrated in 1820 by Ernst, a veterinary surgeon of Zurich, Switzerland.

The medicinal treatment that has been most beneficial is the external application of a saturated solution of salicylic acid and alcohol, applied directly to the affected zones by means of a piece of sponge or other material tied on the end of a stick or with a hard rubber syringe. This remedy is very well where there is only a small portion of the skin attacked, but because of the intense pain the application causes it should not be applied to more surface than would measure three decimetres each way at one time. Two or three applications of this remedy will destroy the fungus, thus staying the extension of the trouble. A small quantity of collodion added to the solution increases its efficiency. Preparations containing sulphur can be used when there is a large surface of the skin to be covered at one time. The sulphuretted calcium made by boiling quicklime and sulphur together has been highly recommended. An ointment made up of sulphur, oil of tar, and sodium borate, is very useful, but must be applied many times. Creolin preparations are valueless in the treatment of this affection. Iodine preparations, especially the aqueous solutions, often effect a cure.

When once "adobe" has started in a troop or other organiza-

tion, affected animals should be isolated without loss of time, as also should their halters, grooming utensils, etc. The remainder of the horses should be scrubbed with water in which about eight ounces of bicarbonate of soda to the ordinary United States stable pail of water has been dissolved, and with the free use of soap. The picket line and posts near which the sick animals had been should also be scrubbed with the same solution. This has generally prevented the further spread of the disease. No doubt there are a great many more efficient antiseptics which might be used with advantage, but the veterinarian in the United States army is laboring under the great disadvantage of having at his command only a few drugs which have been considered obsolete by practising veterinarians for many years. It is to be regretted that there has not been an intelligent issue of drugs to the different organizations which are serving in the Philippines, so far away from any place where the veterinarian could obtain necessary articles from some store. In the whole list of drugs that are allowed the different troops in the army there is not one that is an absolute necessity or one that would be of any decided advantage in case of a serious outbreak of contagious disease. There is no doubt but what those lists were made out at a time when there was little or no sickness amongst troop horses, and for the benefit of that class of persons that delighted to empty all kinds of nasty messes of bulky medicines down a suffering creature's throat, said medicines to cause as much pain by burning, scalding, choking, etc., as possible, and not intended in any way to alleviate the sufferings of the helpless dumb brute.

THERE are 20 students in the freshmen class at the New York-American Veterinary College this session, making an entire class of 50.

THE department of "Reports of Cases" is always one of the most valuable in a medical journal. It has been especially so in the REVIEW recently—this month is a good example of what it should always be. Every subscriber is cordially invited to use it as freely as he may wish in "building up the solid edifice of pathological science."

ANTHRAX: PREVENTIVE INOCULATION IN LOUISIANA.

BY W. H. DALRYMPLE, M.R.C.V.S., BATON ROUGE, LA.

A Paper read before the American Veterinary Medical Association, Sept. 5, 1901.

I had expected to be omitted from the programme on this occasion, but our worthy Secretary seemed to experience the usual difficulty in getting some of the younger members "roped in" to present papers, and being anxious that the subject of anthrax and preventive inoculation should be brought up, on account of its apparently wider prevalence and distribution throughout the country, I felt constrained, though somewhat reluctantly, to accede to his urgent appeal—and we all know the inimitable way Dr. Stewart has of placing a fellow *hors-de-combat* when it comes to work connected with the interests of the A.V.M.A. I say reluctantly, not from waning interest, by any means, in the welfare of the association, but simply from lack of time at my disposal to prepare a paper that would be at all creditable for presentation at the representative assemblage of the veterinary profession of America, or do justice to a subject of such immense importance, when viewed from the standpoint of the vast livestock interests of the country, and more particularly, perhaps, our Gulf group of States. I will have to crave your indulgence, therefore, if my hurriedly prepared production should not approach the standard for an occasion such as this.

I think I can truthfully say that the control of anthrax, and the possible eradication of the infection, is one of the most profound problems that confronts the agriculturist and stockowner, as well as the veterinary profession, in Louisiana and the contiguous States. Such an unfortunate condition as has existed, and as at present exists, with us, is to my mind solely due, up to within recent years, to ignorance of the true nature of the disease, and of the most effective sanitary measures for its control.

It is unnecessary to go into the ancient history of anthrax. All of you who keep up with our fatal animal plagues must be

perfectly familiar with the historic division of the subject. We may say, however, that anthrax, or charbon, as the French term it, is one of the oldest diseases known to medical science, and is almost universal; that it is exceedingly dangerous and fatal, both to humanity and the lower animals (past records showing frightful devastation through its ravages); and that it is brought about by the introduction into the economy of the spore-bearing organism, the *bacillus-anthraxis*, the specificity of which was, I believe, first recognized by Davaine in 1863.

I will not occupy your time with the bacteriology of the disease. Suffice it to say, that the organism belongs to the spore-bearing variety; that it is ærobic; that the bacilli, only, are found in the blood, where they multiply by fission, *i. e.*: elongation, and division into segments; that sporulation takes place outside of the body when bacilli-laden blood is exposed to the atmospheric oxygen; that the spores are the more resistant to external, germicidal, and other influences; and that they will remain for a great length of time in ordinary external surroundings—and possibly vegetate there—and be capable of causing infection in man and animals when introduced into the system by different channels, and through the intermediation of various agencies.

The channels by which the organism gains entrance to the circulation are generally recognized as three, viz.: The alimentary tract, the skin, and the lungs. I have seen it recently stated that "authorities, without exception, were agreed that the almost exclusive method of infection in cattle was by taking the germs in adhering to food, or in drinking water." This may hold good in some countries, but the opinion does not altogether agree with my own experience in Louisiana.

True, I believe that first cases result from infection in this way, especially where no precautions had been taken to properly dispose of anthrax carcasses in previous years, which, unfortunately, has been the case in my State. But I think there can be no question that the different varieties of horse-flies (*tabanidæ*), and other blood-sucking insects, are more responsi-

ble than any or all other agencies combined, in spreading the disease in the Lower Mississippi Valley. Of course, the first cases are responsible in providing the source from which these hordes of insects obtain the virulent material for inoculation.

Let us devote a few seconds to the consideration of a case that is an early victim of the disease, and which has been left exposed on the surface of the ground, and see how we can charge responsibility of spread to such a source: At, and immediately after death, the blood is simply swarming with anthrax bacilli. It is a common occurrence in Louisiana to witness thousands of blood-sucking flies loading up on the virulent blood at this time, and it is almost immediately succeeding such occurrence that we begin to find numerous cases of anthrax of the external or carbuncular form, and at points widely separated, the tabanidæ, as you are no doubt aware, being exceedingly strong on the wing, and capable of flying immense distances.

On account of rapid decomposition of the body, and the evolution of gases after death, we have bloody discharges issuing, probably by pressure from within, from the natural openings. This virulent material exposed to the air permits of the bacilli contained within it undergoing the process of sporulation, contaminates the surroundings with which it comes in contact, besides becoming a source from which other varieties of fly-scavengers, which do not puncture the skin, can obtain the virus on their mouth-parts and feet, and are then capable of transmitting the infection to susceptible animals having abrasions of the skin. Grass, herbage, and other food materials grown upon the soil contaminated by the charbonous discharges from the dead animal may, and often do, as has been proved in many instances, become infected by the adherence of spores to these materials, and cause outbreaks, not only in the vicinity of the victim, but wherever such food-stuffs may be transported. Virulent discharges from the carcasses that have been washed by rains into running water or streams may not only contami-

nate the water supply of livestock in the immediate neighborhood, but by receding, after a freshet, infect the grazing along the banks of such water courses. Our valuable scavengers, the buzzard and the carrion crow, are no doubt responsible for spreading anthrax infection from the dead animals, for, after soiling their feet by walking over the blood and offal, as well as by other means, they are capable of producing fresh centres of the disease on the grass of fields and other places on which they alight. Hogs, or swine, many of which, with us, are not under the immediate control of their owners, spread the infection by first of all contracting the disease themselves, as well as carrying infection on their feet and snouts, then dying at some distance away, and creating new foci, and sources from which more virulent blood may be obtained. Similar allusion may also be made to the wandering cur-dog.

These are some of the commoner agencies with us, by which infection is spread from the early victims or first cases left unburned or uninterred, which, however, does not include the skinning of carcasses through ignorance of the danger to the operator, or of distributing the infection by such procedure. But in addition to the carcasses of the domestic animals as sources of the virus, we occasionally have, in extensive epizootics, some of the wild animals, such as deer and others, in our swamps and woods, becoming affected, and thus enlarging the infected areas.

Such, I may say, has been the condition of affairs with regard to anthrax in Louisiana. For how long, no one knows; but, at all events, from a time antedating the recollection of our oldest inhabitants.

Fortunately, I am pleased to be able to say, the situation is beginning to show marked evidences of improvement, as the result, I presume, of a persistent effort to inform our people concerning the true nature of the disease, how it may reasonably be prevented, and the great importance to be attached to strict sanitary measures for its control and possible eradication, although the latter is improbable in the near future, owing to

permanently infected areas and other unfavorable existing conditions.

The internal form of anthrax is, of course, produced by the ingestion of food or water infected with the specific organisms of the disease.

External or carbuncular anthrax can be brought about through any medium by which the infective germ is brought in contact with the superficial circulation or absorbent vessels. Many of these may be readily imagined, but there are one or two recorded cases in man that may be of special interest. Some year or two ago a case of death from malignant pustule was reported, in which an employé of the London general post-office became infected through an abrasion, or sore, on his hand while handling a piece of leather out of which he was making box-hinges. And the fact has been established, I believe, that even the ordinary tanning process now in vogue is not sufficient to destroy the virulence of the anthrax spore. I have observed, also, in an English medical journal or magazine, where one or two boys in one of the manufacturing towns succumbed to this disease as the result of cleaning the parts of a carding mill, they at the time having cuts or wounds on their hands. Evidently the mill must have had wool from charbonous sheep previously passed through it.

It is to the horse- or gad-fly, however, that I desire to make special allusion, as being, in my opinion, the most potent factor in the spread of carbuncular anthrax in Louisiana.

No one, who has not been an eye-witness, can have the most meagre conception of the appalling numbers of these tabanidæ, during certain seasons, in what might be termed the anthrax districts of our State. I understand there are something like 300 species of this family of flies, and that about 150 of them occur in North America. Porchinski, a Russian entomologist, who has made some study of the life-history and habits of this hitherto somewhat neglected order of insects, states that "water and arboreal plants are the chief conditions of the existence and multiplication of the family to which horse- or gad-flies belong

and where these conditions are absent no tabanidæ are observed." All such favorable conditions we possess in abundance in the sections of Louisiana which suffer most from anthrax. For instance, at the back of many of our plantations are woods and moist places, such as swampy lands, and it is to those uncultivated portions of the properties that the remains of all animals have been committed. All carcasses have been treated alike, whether charbonous or otherwise, viz.:—dragged or hauled out to the "bone yard," and there left, exposed on the surface of the ground. This practice has been in operation almost from time immemorial (although it is now changed for the better in most places), with the result that infection has been yearly added to the surroundings. *Now*, we find that first cases usually occur amongst animals, frequently cattle, in the neighborhood of these infected areas. With the development and multiplication of the *flies*, and the blood of the first victim at hand to feed upon, it may readily be inferred how the infection is scattered broadcast.

It has generally been observed that outbreaks of anthrax, in epizootic form, in Louisiana, usually succeed protracted seasons of drought in summer, and, after the breaking of such drought by the first few showers of rain. On the other hand, the disease rarely occurs over an extended area, and if at all, in only sporadic or enzoötic form, during seasons in which we have frequent and copious precipitation. This may be accounted for, first of all, by the fact that a lengthened dry spell of weather favors the development and multiplication of greater numbers of horse-flies, many of which would be destroyed in the oval or larval stages by incessant heavy rains during these more delicate stages of the insect's life.

Then, again, the moisture from the showers, following the dry weather, combined with the natural heat of our summers, brings about conditions favorable to the development of latent bacterial life already in existence in infected localities.

When heavy and frequent rains continue during our summers, we seem to have fewer of these flies, for the reasons, no

doubt, just stated, and, it is reasonable to presume that a great deal of the infection is washed from off the surface of the ground, and of the vegetation, and carried away by running water, as streams, rivers, etc. This, of course, creates a menace to territory below, and through which such water passes. As an instance of this, we got infection on the pasture of our State Experiment Station, through the discharges of a charbon victim, belonging to a neighbor immediately above us, being washed into a branch which runs through it. And, the lands of our State, bordering on the Mississippi River, might easily be infected from the State of Mississippi to the north of us, as I understand numbers of the victims of the recent terrible epizootic there, before the authorities took action in the matter, were thrown into the river to float down.

The third mode of infection is by way of the lungs or respiratory tract; but, although the human subject contracts anthrax as "wool-sorters' disease," by inhaling the desiccated spores from the wool of sheep that has been soiled with infected blood, I do not think that animals often receive infection in this way, and if so, it is of somewhat rare occurrence. At all events, I should consider this mode quite infrequent as compared to the others mentioned.

PREVENTIVE INOCULATIONS

were first made by Toussaint, but were apparently unsuccessful in obtaining the desired results. Pasteur, however, demonstrating that immunity was produced by weakened virulence on the part of the organism, obtained an attenuated virus by cultivating the bacterium at a temperature of 42 to 43 degs. C. in the presence of oxygen. There are other processes of preparation of the virus, but the lymph that I am most familiar with, and the one which has been put into practice in almost all Continental European countries, is that prepared by the Pasteur method. The dose of this virus comprises two inoculations. The first lymph, or first half of the dose, is that which has been cultivated, under the conditions above mentioned, for about 24 days; the second lymph, for about 12 days. The first dose is, there-

fore, the more attenuated, and seems to be somewhat preparatory to the second, which is more powerful. An immunizing dose requires one-quarter of a cubic centimetre of each strength given from 10 to 14 days apart.

The records of preventive inoculation by the use of the attenuated virus, especially in European countries, seem to be extremely gratifying. And I think I can confidently assert that excellent results have been obtained in Louisiana, when all the conditions were favorable, such as good material, strict antiseptic care observed in its use, and the operation performed early in the season, so as to secure immunity before the advent of the hot months during which the disease usually makes its appearance.

With the exception, perhaps, of a very few individual planters, who imported virus direct from France, preventive inoculation against anthrax was but little known or practiced in Louisiana previous to 1896.

In that year we had an extensive outbreak in the northern portion of the State, but in a section containing all the conditions favorable for the propagation of horse-flies to carry abroad the infection, and I certainly never before witnessed such a "fly-plague." It was at this time that I suggested the use of the anthrax virus, and the doses used that season throughout the State amounted up to some thousands. Since then the use of the lymph has been fairly general, especially in the localities in which anthrax had been prevalent, as well as in those contiguous, until, during the past summer, the large number of about 30,000 doses of the Pasteur lymph alone have been used.

It is difficult to obtain accurate data with regard to the positive results of preventive inoculation in Louisiana, the work of vaccinating having fallen, to quite a large extent, into the hands of those with a very limited knowledge, if any, of the importance of strict antiseptics. Some of the untoward results arising in consequence may here be noted: Extensive septic infection from dirty instruments, etc., and in some cases from infection of the virus through careless handling, such as frequently open-

ing the vial before its contents were all used up. Using wrong virus. I have it on good authority that black-leg vaccine has been used on several occasions for anthrax lymph; the reason for the error being, I presume, due to the fact that black-leg vaccine is frequently labelled for symptomatic charbon or anthrax, and the operators being ignorant of the difference. Quite recently I have observed, through our daily press, that a number of cases of tetanus had followed vaccination for anthrax. It is difficult to account for this except through the proper precautions being neglected during the operation, through after-infection of the inoculation punctures, or through virus infected with tetanus organisms. If the latter, it shows how completely the veterinarian is dependent upon the reliability of the manufacturer and vender of these products. Want of due protection and care of inoculated animals before complete immunity is established, in the midst of an epizootic of anthrax, has also brought about indifferent results, etc.

The best season to vaccinate in our climate is almost any time before the heated term, so as to permit of complete immunity before the climatic conditions appear that are favorable to the development of bacterial and insect life.

Personally, I have vaccinated only a few hundred head of stock, the most of the work in recent years being done by practising veterinarians, managers and owners of plantation and farm stock, a few physicians, and a number of "quack vaccinators." Although I wrote to several practitioners in the State for the results of their experience with preventive vaccine, I failed to get a response in the majority of instances.

I have a record from a physician who assisted in inoculating stock in the 1896 epizootic in North Louisiana. During the height of the outbreak he vaccinated some 250 head of horses and mules with the Pasteur lymph. After the first inoculation about 3 per cent. showed symptoms of the disease, but not more than 50 per cent. of the 3 per cent. died. After the administration of the second lymph there were no more deaths, with only a few animals exhibiting symptoms. At the same time,

however, unvaccinated animals in the neighborhood were dying with great rapidity. During this same outbreak there were other somewhat similar records, but I have not the exact data. In the spring of 1897 I vaccinated over 200 horses and mules in one locality without a single case, so far as I know, of œdema at the point of inoculation larger than a pigeon's egg. Vaccination has been carried on since in this vicinity, but I have not heard of a single death, although the disease was in the neighborhood this summer.

In 1899, the owner of five large sugar plantations, with an aggregate of 368 mules, furnished me with detailed statistical results of vaccination that summer, a summary of which is as follows, viz. : 39 cases and 14 deaths ; or,

Average number of animals taken sick	10.6
Average number died	3.8
Average number of deaths of sick animals . . .	35.9

During the 1899 outbreak, and while making some investigations into the history of anthrax in different portions of the State, the owner of a large plantation in a charbonous district below the city of New Orleans informed me that he had vaccinated about 100 mules for the previous 5 years, and had lost only two animals during that time, one not inoculated, the other permitted to graze on a headland over which anthrax carcasses had previously been dragged. In the summer of 1899 the disease was epizootic all round the neighborhood of this plantation, with flies excessively numerous ; such being always the case during the years in which we have the most widespread outbreaks.

In my own parish of East Baton Rouge we had that same summer a few cases transmitted from a neighboring parish, in which a large number of all kinds of animals were lost. Precautions were at once taken, through the local authorities of both parish and city, to cremate all victims known to have died of anthrax, and to inoculate extensively. This put a check to the spread ; but early in the spring of 1900 a bull, which had been roaming over the locality where the disease had appeared

the previous summer, died near our Experiment Station (to which case I have already alluded), and was the means of causing the death of a cow, a horse, and a mule belonging to the station. Every precaution was taken to prevent further disaster, such as cremation, thorough disinfection, and the inoculation of some 15 or 20 head of the remaining stock. And although the animals were turned back on the pasture about two weeks after immunity was established where the first case occurred, there has not been a suspicious case on the place since, a period of about sixteen months.

The past summer the disease broke out in two wards of our parish. Strict attention was at once given to cremation or deep burial of the cadavers, as well as inoculation, and the disease was checked in each instance, one ward losing probably ten animals before proper measures were adopted, the other ward losing one mule.

An extensive land-owner and merchant of my acquaintance vaccinated this summer 127 head of mules after anthrax had broken out close to his property. I saw the animals about ten days after they had had the second lymph, and up to that time he hadn't lost a single one.

Dr. E. Pegram Flower, a graduate practising in the city of Baton Rouge, inoculated about 2400 animals, chiefly mules, the past summer in our State, and about 500 in the Mississippi Delta, all being exposed to infection, *i. e.*, the disease was prevalent all around the vicinity. His losses in Louisiana amounted to not more than one-quarter of 1 per cent., while in Mississippi only 7 animals out of the 500 died after inoculation was commenced, notwithstanding the fact that over 100 died in the neighborhood previous to inoculation, the infection being of such a virulent character.

In the summer of 1899 this same gentleman inoculated some 1800 head of stock in our State, and with a loss of not over 1 per cent., which seems to me to be a very satisfactory showing in favor of the use of the preventive vaccine.

Perhaps the most convincing evidence of the beneficial effect

of this method of prevention in Louisiana is the fact that in those localities which suffered most from yearly, or at least periodic, epizootics of anthrax before vaccination became so generally adopted, experienced the past summer a wonderful degree of immunity from the disease, which I think we must attribute to the fact that the use of the lymph is now almost general in those sections, and that greater attention is being directed to the more careful disposal of the dead animal, our people more fully appreciating *its* being the chief source from which this most deadly disease is spread.

I believe we are gradually solving the anthrax problem in the Pelican State, and the progress we have already made is, I think, considerable and fairly satisfactory, when we take into account the amount of ignorance, superstition, and the erroneous and visionary ideas which prevailed up to 10 or 12 years ago regarding the true nature of the disease and the most potent factors in causing its spread. What we have accomplished has in great measure, I think, been due to a persistent endeavor to educate our people; for we have no sanitary laws of much importance, and no live-stock sanitary board or commission vested with authority to properly execute those we have. This condition of affairs, however, we hope to see changed in the near future. I question very much if ten years ago a single dose of preventive vaccine was used or an anthrax carcass destroyed as a sanitary precaution against the spread of the disease in our State. To-day there are probably 40,000 or 50,000 doses of vaccine used, and carcasses are being much more carefully looked after, which I feel indicates *some* progress, at least.

With years of added infection in our anthrax localities, and with such favorable climatic conditions for bacterial and insect development as we possess, complete extermination of the infection cannot be looked for in the immediate future. So we must endeavor to live amongst it by rendering ourselves immune against it until such conditions arise by which we can stamp it out. Our measures must be preventive and strictly sanitary, the importance of both of which we have been trying to impress

upon our authorities and people. First of all, preventive inoculation in the hands of competent individuals; the careful and proper disposal of all anthrax carcasses, so as to limit and deprive of the source of future spread of infection, and thorough disinfection.

The question of the destruction or extermination of the horse-fly in the swampy or moist sections of our State is a monstrous one and should be taken up and thoroughly investigated by the entomologist, either State or national. But, so far as I am able to see, there are only two methods by which the problem might be solved. One is to thoroughly drain and reclaim such localities, which I expect will be accomplished some day; and the other, although rather more unlikely, is to turn on one of our now famous "oil-gushers," and destroy the flies in their watery haunts with mineral oil, as Porchinski succeeded in doing in the forest pools in Russia.

THE COMPARATIVE VIRULENCE OF THE TUBERCLE BACILLUS FROM HUMAN AND BOVINE SOURCES.—Dr. Mazyck P. Ravenel (*University of Pennsylvania Medical Bulletin*, September) sums up an exhaustive article on his experimental investigations into this subject as follows: In view of the foregoing experiments and of the evidence quoted, it seems justifiable to conclude: 1. That the tubercle bacillus from bovine sources has, in culture, fairly constant and persistent peculiarities of growth and morphology, by which it may tentatively be differentiated from that ordinarily found in man. 2. That cultures from the two sources differ markedly in pathogenic power, affording further means of differentiation, the bovine bacillus being very much more active than the human for all species of experimental animals tested, with the possible exception of swine, which are highly susceptible to both. 3. That tuberculous material from cattle and from man corresponds closely in comparative pathogenic power to pure cultures of the tubercle bacillus from the two sources for all animals tested. 4. That it is a fair assumption from the evidence at hand, and in the absence of evidence to the contrary, that the bovine tubercle bacillus has a high degree of pathogenic power for man also, which is especially manifest in the early years of life.

TUBERCULAR INVASION IN SWINE.

BY B. F. KAUPP, D. V. S., KANSAS CITY, MO.

Read before the Missouri Valley Veterinary Medical Association at Kansas City, Mo.,
May 25, 1901.

About a week or ten days ago I was asked by the Secretary of the association to prepare an article on tuberculosis, but informed him I was very busy and that that was too short notice. It was left for me to make an attempt, so will only try to bring out some practical points as they have presented themselves to me in post-mortem work during the past few years. It is needless to say that tuberculosis affects every species of animal, including man, cattle, hogs, not so common in the horse, dog and sheep, frequently found in wild animals kept in confinement, whether they be meat-eating animals or not, and also found in birds and fish. It is an infectious disease produced by the bacillus tuberculosis. The disease has probably existed for ages, but not until 1882 was the microörganism producing it discovered by the noted scientist, Dr. Koch. It is a fine rod-shaped bacillus of an average length of 2-5 m. or nearly two-thirds the diameter of a red blood cell. It is easily cultivated in agar agar and other media at body temperature and is easily colored by aniline dyes. The reproduction of the bacillus is brought about by transverse segmentation; they generate spores, which have a great resisting power to destructive influences. These spores may again produce the bacillus. I will not enter into a discussion of the structure of the tubercle, as that has been gone over so often, but will confine my paper more to the modes of infection. We may see the disease manifest itself locally in the skin (lupus). It may invade the lungs (phthisis pulmonalis). In the serous membranes, as the pleura or peritoneum (pearly disease). In the intestines and adjacent lymph ganglions (tabes mesenterica), etc.

In man infection is understood to take place principally through the respiratory tract, although it may take place by ingestion of tubercular flesh and milk.

In cattle infection principally takes place through the respiratory track; the lungs and adjacent lymph glands being most often primarily affected; but it is not uncommon to find milk cows with the peritoneum and other organs of the abdominal cavity affected and find no visible lesions in the thoracic cavity.

In swine it appears to be quite different; the infection seems to be through the digestive tract. We may find it invading the lymphatics, in some instances, in all parts of the body. In others confined to the lungs and other organs of the thoracic cavity, while other times to organs of the abdominal cavity, and rarely in bone alone. I have seen two cases of tubercular arthritis, one of the carpal joint, the other of the tarsal. It has been thought by some investigators that the primary lesions of tuberculosis in swine was in the abdominal cavity, principally in the spleen and liver, with adjacent glands. It had also been noticed that in hogs where the abdominal or thoracic lesions were present the submaxillary or other lymph glands of the head were almost invariably invaded. Further investigation has shown that in the hogs of the central States the primary lesions are most always in the glands of the head, the submaxillary being the gland most often affected, very rarely the salivary glands. Of 200 cases 55 were found to be localized principally in the submaxillary lymph ganglions, no other visible lesions present; 45 per cent. were generalized, but the per cent. may vary in different herds; of those that were generalized the organs most affected were the spleen and liver and adjacent lymph glands, next the bronchial and mediastinal lymph ganglions and lungs, pleura and intestines less frequent. Occasionally there may be found a case of generalized tuberculosis affecting the principal lymph ganglions of the body.

In one case I call to mind was found the submaxillary, prepectoral, bronchial, portal, colic, ileocæcal, mesenteric and other lymph glands, with no visible lesions in the organs. While, on the other hand, there has been found lesions in the liver and spleen or lymph glands of the abdominal cavity, with no lesions in the head or thoracic cavity, and also infection in the lungs

and adjacent lymph structures with no head lesions, but these cases form a very small per cent. In some instances where there has been found abdominal lesions there was also observed upon close examination minute tubercles in the intestinal wall, some located between the mucous and muscular coat, others between the muscular and serous. Then, again, we find a peculiar condition affecting the submaxillary, bronchial, and portal glands and the liver, with no other visible lesions. We often find the pleura invaded with no lesions in the lung substance, and it has been noted that the tubercle appears to push out from the under side of the serous membrane.

This being the fact, that the lesions in the larger per cent. of the cases are primarily found in the glands of the head, what conclusion must we deduce? That infection takes place through ingestion, and that the microorganism gains entrance through the buccal mucous membrane, but how, is the question. In fact, the bacillus being non-motile has caused much time to be spent by writers in elaborating on theories as to how this end is brought about.

We know that hogs eat rough substances, such as stone, coal, glass, and I have found, besides these, nails, staples, hair and other objects in stomachs examined. These sharp and rough or pointed bodies may lacerate the buccal mucous membrane, and another thing to be taken into consideration is the teething period in young hogs, at which time there may be abraded surfaces; any catarrhal or inflammatory condition which would cause an exfoliation of epithelia or abrasion or to so weaken the cells as to make entrance possible. Again, it has been demonstrated that the bacillus, which we know to be vegetable, sometimes throws out prolongations (see Friedberger and Fröhner's "Pathology and Therapeutics of the Domestic Animals"); might not the bacillus become lodged in a fold of the buccal mucous membrane and under favorable conditions, which would be afforded in the mouth, that is, heat and moisture, etc., develop or throw out a prolongation, gradually entering between the epithelial cells as it grows, and in this way gain entrance? Again, the

theory has been advanced that the bacillus has the power of secreting a substance which weakens the cells and thus makes its entrance possible. After gaining entrance through the buccal mucous membrane, the bacillus is probably seized by a leucocyte, or at least gains entrance to the lymph vessels, which drain the mouth cavity and which empty into the ganglions of the head. The submaxillary receiving the most of the lymph from the buccal cavity would lead us to suspect them to be most often affected, which has been found to be true. The same causes which so alter the mucous membrane of the mouth as to make the entrance of the bacillus possible, may also cause such alterations in the intestines. Tuberculosis in swine appears to be of a virulent type. It is not uncommon to see shoats five or six months old in advanced stages, in some instances every organ in the body, including the pleura, invaded.

Another interesting point is the source of infection. It appears from post-mortem lesions found, that a very small per cent. become infected through the respiratory apparatus, but that infection most often occurs through the digestive tract, and apparently primarily through the buccal mucous membrane. Milk from cows having tuberculous udders is probably one of the principal sources of infection, but in tuberculous cattle we find a very small per cent. of the udders affected, but the bacillus has been found in the milk when the udder showed no visible lesions. It is the habit of feeders to allow hogs to follow the cattle for the purpose of picking up grain not digested, and in this way save feed that would otherwise be wasted. Would it not be fair to suppose that probably these cattle, if tuberculous, may have tuberculous ulcers in the digestive tract, or if of the pulmonary type, the sputa swallowed after coughing instead of expectorating, and thus pass through the digestive tract to the ground. I believe another source of infection is through swill. It is a common habit with many people to keep a slop pail in the kitchen for the purpose of throwing dish water and waste matter, which is afterwards fed to the swine. This is a convenient receptacle for persons affected with pulmonary tuberculosis

to expectorate, in which case the virulent material would be continually fed to the herd. It is hardly probable that much infection is brought about by eating tuberculous flesh. Although it is the habit in the country by some people, when an animal dies, to drag it out to the woods and let the hogs devour it; and should it be a tuberculous one, would probably be the cause of infecting many individuals of the herd. I know one instance in a city on the sea-coast which had a meat inspection system. The inspector, different from most city inspectors, had scientific training, and informed me that he found considerable tuberculosis among the cattle. Upon inquiring as to what disposition was made of the condemned carcasses, was informed that the only thing he could do was to load them up and send them to the "dump," but, says I, "you will infect the fish and get the tubercle at last by eating the fish." And from the beach they were seining fish by the bushel. I have often thought that the refuse from the large packing establishments which is drained from the slaughter-houses through the sewers to the rivers might contain some infection which would be carried to the river and possibly devoured by the fish.

THE COLORADO ANTI-DOCKING LAW has received a body blow. Last week Judge Lindsey decided that this law was unconstitutional in that it interfered with inter-State commerce by forbidding the importation of docked horses into the State. Col. J. W. Springer, President of the National Live Stock Association, was therefore fully sustained in his inter-State commerce rights to bring into Colorado horses with docked tails. It will be remembered that the suit to test the validity of the law was brought against Col. Springer in Denver in a more or less friendly spirit, but the defendant had determined to carry the matter to the United States Supreme Court had he been defeated. He contended that he was perfectly within his rights under the inter-State commerce law to bring into Colorado horses docked or undocked as he saw fit, and the court took his view of the matter. The case was ably conducted on both sides and hotly contested, the object of both parties being to get a decision that would really decide one way or another.—(*Breeder's Gazette*, Sept. 11.)

THE INFLUENCE OF ALTITUDE ON THE RESULTS OF SURGICAL OPERATIONS.

By J. A. McCRANK, D.V.S., PLATTSBURGH, N. Y.

Read before the 11th Annual Meeting of the New York State Veterinary Medical Society, at Ithaca, Sept. 11, 1901.

Located on the shores of Lake Champlain and at same time at the base of the mountains of the Adirondack range, my field of practice is varied in altitude, and, like every other practitioner in a country district, I meet with various classes of cases. There is just one class of cases I will deal with in this paper and that is the case where surgery is the only treatment. Often on such calls I have attempted feats which I often thought I should not have attempted, but the results have afforded me material to make up this paper. Thus you will understand that this thesis is but the recorded observations of the writer, and if I were capable of arranging the reports of a few cases with the respective results in the style of an artist—or clothe my expressions with fitting explicitness, possibly this paper would be a treat.

When I first located in my present field, about ten years ago, my attention was drawn to a number of cases of "umbilical hernia" in colts from one to four years old, and scattered over the country. I was frequently asked if those cases could be operated upon successfully, for the animals were useless as they were; my reply was "Yes," if the right man undertook the work. I was very anxious to try one, but despaired of success. I did not want to fail in my first attempt and a stranger in the place and wanting to gain a foothold in the estimation of my people. I considered the venture too great. I finally undertook to operate on Mr. Arnold's colt, which was two years old.

I had never seen such an operation, but read reports.) The colt was on the farm, about 10 miles from my office, and at an altitude of about 950 feet above the lake. I used the ordinary means of restraint, no anæsthetics were used, for I had no one to help me on whom I could depend, but all instruments, etc., were antiseptic; my assistants were of poorest quality, as you will soon see. When all was in readiness I made my incision, which sev-

ered all integuments, peritoneum, etc. The beast made a struggle at this moment, all my assistants scampered off and left me alone. The beast rolled on her side, a great amount of intestines gushed out and fell among the grass. It was some little time before I could right things. I washed the exposed intestines, returned them. I next scarified the edges of the umbilical opening, stitched the skin, muscles, etc., dressed the outer wound with iodoform, absorbent cotton, oiled silk, etc., then applied the strong bandage, and allowed the beast to rise. I gave orders to feed sparingly with soft feed for five days, thinking at the same time the beast would be attacked with peritonitis and possibly die after such bungling work. At the end of five days I visited the patient, removed the bandages and found a wound, healed by first intention, a perfectly clean surface without a particle of pus. The beast recovered quickly and a strong smooth surface remained where at first there was a bunch as large as my two fists. Two weeks afterward I operated on two other colts on the same farm with similar success. Next colt I operated on was a filly for Dr. F. on the low lands. I used all antiseptic precautions, for I had an M. D. to assist me; I had more confidence in myself and in my assistants. At the expiration of five days I removed the dressing to find a mass of pus and the wound was not healed; on the ninth day pus was yet to be found and on the fifteenth day the wound was healed and dry—that is, free from pus. Since then I have operated several times on both low and high lands and have had the same results every time.

There is another class of cases which we meet with in our routine work and that is the case of "poll-evil" and "fistulous withers." Cases which I never wish to meet, but we must take the bitter with the sweet, and do the best we can.

About June, 1895, Mr. Lyon bought a four-year-old colt for \$15. The beast never was harnessed. It was strong and large, but he had fistulous withers of two years' standing. Every quack in the country had tried his specifics or caustics. Turpentine, the skin of a frog and various other sure cures, but the beast got worse, and the owner sold it for \$15. Mr. L. sent for me

when he got the horse. I did not like the looks of the case, but I must try. I cast my patient, and after exposing the diseased tissues, I found five of the dorsal spines diseased, black and porous. It was necessary to remove from one-half to one inch and a half of them, after which I washed the cavity out thoroughly, gave good drainage and let the animal arise. I now gave directions how to feed and to report to me if any unfavorable changes took place. I supplied the man with a considerable quantity of washes and came away. I will tell you in confidence that I was not at all proud of my work, for both the wound and the horse looked horrible when I was done. In eleven weeks from that date Mr. Lyon sold this young horse for a round price, \$95 I believe, and he never was troubled with a sore in that region afterwards. Mr. Lyon's home is about 1000 feet above the level of the lake.

During September of 1898 Mr. Legare, of Rand Hill, about 1900 feet above the lake, brought to me a young horse with "poll-evil," and as near as I could ascertain from the history of the case it was of over a year's standing. I did not cast the beast, I got good drainage by passing two setons, gave him a large quantity of wash and sent him to his home. He did not pay me, neither did I think I merited much pay, for my success in the low lands was so poor that I thought the man would be out of pocket what he would pay me. During the next May this man drove to my office to have me operate on a calk boil, and sure here was my patient of last September sound as ever. The owner paid me well for the work, for I had heart to ask a good fee, and he informed me that the wound healed up in three weeks.

When I meet with such cases on the low lands I seldom have success the first time I operate and often I fail the second time, and sometimes I never succeed.

Many of my readers have no doubt been called upon to reduce a fracture, and when it is a fracture of a limb, sometimes, like myself, you object to operate because the beast is old, or because there are external injuries, as a bone protruding through the skin, bruises, etc.

In 1894 Mr. A. had a well-bred filly, about nine months old, which suffered a fracture of the metacarpal bone (great) about the distal third; the skin was broken and the ends of the bone protruded and were exposed to the air for hours. I was called, when I found the bone severed and exposed. I advised destruction of the filly. The owner wished me to make an effort, as he wished her for a brood mare, even if she could not be driven. I used the saw to remove the blackened ends of bone and thus make a fresh surface, stitched the wound, put the limb in plaster bandages, leaving the stitched wound uncovered; after this a second set of splints with bandages without plaster were used; those were removed at various intervals to cleanse the wound. At the end of the eighth week I removed the plaster cast to find a good union; the leg was short but almost straight, and to-day she drives fairly well. This farm is located about 1000 feet above the lake.

Buoyed up with this success I tried the next such case for Mr. H. on the low lands. I was on the ground in less than forty-five minutes after the accident, reduced the fracture and treated the case similarly, but I was often called to watch my patient being dressed, where I did not visit my first patient but once. I will just tell the story shortly. I was obliged to destroy the animal in two weeks; putrefaction got ahead of me. Since then I have attempted three cases in the mountainous country with one failure, for I had a comminuted and a compound fracture where the particles were not displaced until time ate away the periosteum, and then destruction was my final treatment. In the low lands if the skin is the least injured I have serious troubles with fractured limbs.

Some time ago while in conversation with Dr. Ransom, hospital physician at Dannemora State Prison, I related to him some of those facts. He told me that in the hospital he thought as little of amputating a leg as if it were but a finger or simple operation. He can operate on a patient to-day, and go for a fishing tour the next day. Dannemora hospital is just 1500 feet above the lake.

Now, brother members, my paper is done. It is but the record of observations of the writer, and has been hurriedly thrown together, with one object in view. There are many clever veterinarians in this land, who possibly despair of success, and think that they are failures in their chosen profession, when the locality is at fault. This paper is written so that they may take heart and plod onward and upward. Keep up with the times, for others will fail in your locality.

ANTHRAX IN HIDES.—The importation of hides of cattle into the United States will hereafter be subjected to strict inspection. The Treasury Department at Washington was informed by various consular officials that foot-and-mouth disease, anthrax and other infectious and contagious ailments prevail in various countries from which hides of one kind and another are shipped to this country and that dealers did not take pains in all cases to properly disinfect the skins. Now a consular certificate will be required by the United States Customs Department with all imports of hides, showing that they are either dry-salted, arsenic or lime-cured and thoroughly disinfected according to the sulphur formula prescribed by the Secretary of the Treasury. Exceptions will be made in the case of hides shipped from Great Britain, Norway and Sweden abattoirs, for in these three countries only cattle absolutely free from all disease may be slaughtered.—(*Breeder's Gazette*.)

TO INVESTIGATE THE TRANSMISSIBILITY OF TUBERCULOSIS.—Dr. Koch's communication to the recent Congress of Tuberculosis has resulted in the appointment of a Royal Commission in England to inquire and report with regard to tuberculosis: (1) Whether the disease in animals and man is one and the same. (2) Whether animals and man can be reciprocally infected with it. (3) Under what conditions, if at all, the transmission of the disease from animals to man takes place, and what are the circumstances favorable or unfavorable to such transmission. The commissioners are invested with full powers to call before them any witnesses whom they desire to question, to have access to all documents and inspect any places they deem expedient for their purpose, and while they are at liberty to report from time to time as they may think fit, it is the royal will and pleasure that they shall publish their full conclusions with as little delay as possible.

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

"BURSATTE" (?) IN THE PHILIPPINES, WITH INTERESTING CLINICAL SYMPTOMS AND POST-MORTEM LESIONS.

By COLEMAN NOCKOLDS, 1st Class Vet., 1st U. S. Cavalry, Batangas, P. I.

An extra large sized mule attached to the 1st Cavalry wagon train was placed upon sick report on May 20, 1901, because of some spongy reddish looking growths which appeared upon various portions of the body. Through the courtesy of Dr. Root, depot veterinarian, the mule was placed in his sick corral, and remained there all through the various kinds of treatments which the doctor was kind enough to assist in carrying out. The location and size of some of the more prominent growths were as follows: One, elliptical in shape, with a circumference of about 18 centimeters, was situated on the external part of the superior portion of the canon of the fore member; one, circular in shape, with a circumference of about 11 centimeters, was situated on the off temple; one of the same size and shape upon the extremity of the nose; one large irregular shaped mass, measuring at its broadest part 10 centimeters, filled in anterior part of the tibio-tarsal angle. Besides these there were several of smaller dimensions in other portions of the trunk and limbs. With the exception of a considerable swelling of the anterior of the carpal joint and the above mentioned manifestations, the mule was apparently in good health. Appetite unimpaired, and pulse, respirations and temperature normal, but always inclined to be sleepy, and increased in weight from the time of admittance into the corral. The general symptoms very much simulated a condition known in India as "bursatte," and which is not uncommon out here.

Various methods were used to get rid of these peculiar neoplasms, both medicinal and surgical.

At first arsenic was given internally and nitric acid, alternated with chromic acid, externally. Later, mercuric chloride internally, alternated with potassium iodide. The growths were removed with the knife, curreted and cauterized in some instances with the actual cautery, others with solutions of nitrate of silver or formaldehyde, but within a day or two of the re-

moval of these turbulent sores they would reappear like a blood-red fungus. On more than one occasion the skin of the ailing mule was abraded either during casting or by a nail or other foreign body, and within a few hours a mushroom-like growth would appear at the seat of injury. Finally, after exhausting all available resources with no beneficial results, the mule was destroyed on August 12, 1901.

Post-mortem.—Six-year-old gelding mule, weight 1200 pounds, very fat (no doubt partially due to a fatty metamorphosis resulting from imperfect oxidation of tissues); external appearance, with the exception of above mentioned lesions, healthy. In removing the skin the swelling at the knee was accidentally punctured and a fluid resembling synovia, but darker, gushed out; the opening was made larger and about a double handful of various shaped bodies were removed, ranging in size from a small pea to a hazel-nut, of a pinkish red color, and mostly filled with fluid, all distinctly separate, the whole being enclosed in one large fibrous sac, which was prematurely punctured during skinning. Each external ulcer when removed with the integument left a cavity, which contained more or less cysts of various dimensions, which resembled very closely the pulp contained in a pomegranate. In various locations in the fascia of the subcutaneous muscles were found cavities containing these cysts, the muscle surrounding them showing evidence of localized inflammation. Beside the muscles and the carpal joint, the lungs and pancreas were the only other portions of the body that showed evidence of disease. Both lungs were very much enlarged, weighing 50 pounds; they were normal in color except for a slightly mottled appearance of a pale yellowish hue. In passing the hand over the outside of the lung it felt as if the organ were filled with shot of various sizes. Upon section a large number of calcareous bodies peeled out; there were many cavities containing fluid and caseous material, and no doubt portions of parasites which were not visible upon a microscopical examination. All lobes of the lungs were affected; the bronchial lymphatics were slightly enlarged, but the bronchial tubes, trachea and lining of the nasal cavities were normal. Wherever these cysts appeared there were signs of the results of inflammation, formation of white fibrous tissues, and myxomatous changes. The cyst formations in the pancreas varied in size from a pea to an orange, and in appearance the tissues did not differ from that of the lungs in any of the essentials.

ACCIDENTAL TENOTOMY, WITH LACERATION OF THE SUSPENSORY LIGAMENT AS A COMPLICATION.

By ROBERT W. ELLIS, D.V.S., New York.

On November 16th, 1900, about 4 P. M., I was called to see a high-lifed, trotting-bred, bay "cob" mare, eight years old, on the street, supposed by the police officers and onlookers to have sustained a fracture. I found upon manipulation of the region of the pastern of the off hind leg, which was bearing no weight, that there was no resistance when the toe was raised forward and upward; and upon causing the animal to place weight upon the limb, the point of the fetlock descended to the ground and the toe of the foot pointed toward the abdomen. A diagnosis of laceration of the suspensory ligament was given, and a guarded although not hopeless prognosis. The history of the case was simply that the mare had become frightened at a combination of noises, caused by a heavy truck going rapidly over the paving stones and electric cars passing, while standing up to the curb, attached to a "runabout," the owner and driver, a lady, being in the carriage, holding the reins, accompanied by a manservant, who was not a horseman. The mare suddenly whirled around short, and before the lady could get control of her, turned the carriage partly over, throwing its occupants upon the street. The mare ran about two blocks, over a sort of triangular course, coming almost to a halt at the end of the first block, by being confronted by a fence; she turned and ran about a block in another direction, and was caught, being thrown in the catching, and was held down until freed from the harness and wagon by the bystanders. At no time during her attempt to get away did she manage to get up any amount of speed, the distances being too short. So that there was nothing in the history to account for so extensive an injury to the suspensory as existed, the mare being in good condition, and in harness every day. "The knife" was evidently used freely in liberating her, judging from the condition of the harness. Among other things, one of the stout traces was severed by a sharp blade. On recognizing the mare's condition, a roll of absorbent cotton was placed about the leg, and a temporary suspensory bandage placed firmly over it, and the mare led slowly to a stable six blocks distant, when a long starch bandage was placed over the absorbent cotton, and the mare allowed to lie down, it being thought inadvisable to "sling" her, in her nervous condition. The next day she was placed in slings, and the bandages and cotton re-

moved preparatory to redressing, and a careful examination of the parts made. This examination revealed the presence upon the inside of the leg, right back of the metatarsus, and between its middle and lower third, of a clean incision about an inch in length in the skin over the tendons; and on passing the finger into this incision, I came upon the perforans tendon cleanly cut through, and the perforatus nicked on its outer edge, but not cut through. I placed my free hand upon the opposite side of the leg, and passed my finger beyond the ends of the cut tendon, and I could feel it through the uninjured skin on the opposite side. After this second examination, I amended my diagnosis, to "Accidental Tenotomy of the Flexor Pedis Perforans, with Laceration of the Suspensory Ligament as a Complication," and reasoned, that the owner of the sharp blade, who had severed that stout trace with so clean a cut, had performed the "tenotomy" with the same stroke. Bearing heavily upon his knife, to cut the trace, he could not stop its impetus in time (after it passed through the leather) to prevent plunging it into the mare's leg. Entering as it did, between the two tendons (nicking the posterior one as it entered), the mare had suddenly straightened out her leg on feeling the prick from the knife, tightened the tendons upon the blade (situated crosswise between them, held firm in the man's hand, as he regained his balance, preparatory to withdrawing it as quickly as it had entered), and severed the one in relation to the cutting edge, the perforans. The mare then sprang to her feet and lacerated the suspensory ligament in using the leg with the tendon already severed, to regain the standing position, unconscious of the fact that the tendon was divided. Hence, undue strain was thrown upon the suspensory ligament, lacerating its fibres.



A steel brace, of the following pattern, was now placed upon the limb. The portion of the brace, represented by a band going around the front of the hoof, has three holes to receive screws, to screw it to the hoof, one in the centre, and one on each end. The leg was first dressed and bandaged, then other bandages, over the brace, binding the leg to it, and bringing the ends of the divided tendon in perfect apposition. These dressings were renewed every second or third day, and the brace kept in place for sixteen days, the mare remaining in the slings.

At the end of that time the brace was removed, and the following illustrated shoe applied. Five days after the application of this shoe she was removed from the slings and placed in a box-stall, bedded with saw-dust, to avoid tripping. The wounds were now entirely healed and the tendon united, but there persisted a very loose movement of the foot, below the pastern. It would be thrown, rather than placed forward, in very much the same manner that a man uses an artificial foot or limb. Stimulating liniment was now applied once or twice daily, and the leg snugly reinforced by an oakum bandage-boot, for nineteen days, at the expiration of which time, she was sent per ambulance to a model stock-farm at Glen Head, L. I. Having preceded her by rail, I was at the farm to see her arrive in good condition, and eight days later I visited her again at the farm, modified the elevated shoe, and blistered the region of the injury, and extending over the pastern joint, with the object of restoring, if possible, the function of the parts. This was repeated twenty-six days later; and six weeks later I again visited her, and ordered the daily application of liniment and a suspensory bandage returned to as before the blistering. The control of the foot was regained, slowly, but perceptibly, so that some time in May (probably five months after the accident), on visiting the farm I had her hitched to a cart and drove her and was pleased to find her going absolutely sound (the owner having applied the same test and arrived at the same conclusion about a week previously), and she has continued to do so to the present day, with no reason for doubting an indefinite continuance. In other words, the mare is as sound as before the accident, and is one of those pretty "actors" that one turns to look at so that any deviation of gait would be very noticeable. The conformation of the leg is slightly changed, measuring slightly more from the front of the metatarso-phalangeal articulation to the back of the sesamoid region than the other leg. Not noticeable, however, to the casual observer. The very novel source of this accident, as I feel sure it must have occurred, there being an uninterrupted union of the tendon ends, with no sloughing of tissue, which could only take place in an incised wound



(and no other object than a sharp knife could enter a small, clean apperture in the skin from one side of the leg, and cleanly incise a large tendon like the perforans), and the ultimate recovery of the lost functions of the part, the peculiar sequel to the injury, *i. e.*, the loose swinging and uncontrol of the foot below the pastern, have prompted me to report this case. The first, because it *is* novel, and the second, because it teaches us to hold on, and not be discouraged, if we have obtained in an accident of this nature union of the parts and have this sequel of apparent partial paralysis, persistent for weeks and even months.

OBSTRUCTION OF THE INTESTINES OF A HORSE DUE TO THE
PRESENCE OF A LARGE HAIR-BALL.

By F. M. PENISTON, D. V. S., Bellemonte, Smith's Parish, Bermuda.

I was called to see a bay mare, about 14.3 hands high, weighing about 800 lbs., 12 to 13 years old, having been owned by the present owner over three years, and had never been sick except on two occasions previous to this. She had become quite thin, or run down, for a short time, but not showing any signs of ill health. I was called on Aug. 30th, and the history as above was given as to her having lost flesh two different times before, as she had done the last month or so. She had slight colicky pains, and had passed no manure during the night. I emptied the rectum, and the fæces were quite hard. I gave her an ordinary colic drench and left two doses in case she had a return of pain through the night. I advised a bran mash that night and another in the morning, and a wine bottle of raw linseed oil. I heard nothing from them until the next day about 5 P. M., and was asked to call and see her. I found her about the same—a little colicky pain occasionally, and eating between the spells as if nothing was wrong. Pulse full and regular, temperature normal, and countenance good. I then gave about one and two-thirds bottles of raw oil, as they had not given all I told them to. The pains were not bad enough or long enough to give an anodyne. On the phone next morning the report was about the same. I waited until 26 hours or so and called, and found her just the same (a little pain sometimes and eating green grass between whiles). I had her exercised and gave soap-sud injections; but nothing passed; so I gave another bottle of linseed oil and ten drops of croton oil. On the phone next morning was told she passed the night just the same. Did not have to give drench to stop pain. I had the injections continued through the day, and

called about 26 hours later and gave exercise and injections, with no result. I then gave aloes gum, $\mathfrak{z}i$; calumet, $\mathfrak{z}i$; ginger, $\mathfrak{z}i$. I then told the owner (Mr. J. I. Wilkinson) that she had an obstruction in the form of a hair-ball at the entrance of the rectum or posterior extremity of the colon, and based my diagnosis on a case I had once before that lived on like this for nine days. On the phone next morning they reported the mare better; bowels had begun to move, and there was no pain. I called as soon as possible to see the result of my treatment, and to my surprise had only had one very small discharge, which was as thin as could be. I kept her very quiet, gave hardly any water, fed on dry oats and hay, and left word to be rung up in a short time, when they said nothing more had passed. However, at night she had had another similar discharge, and through the night only one, and the bowels continued to move like this for three days (about two through the day and one through the night). This kept up for four days, when it stopped, and she was again just the same as when first taken. Pain about every half hour for two or three minutes, then she would eat a little grass, etc. I still held out that a hair-ball was obstructing the gut, but could not understand how it could move for a short time (or four days) and then obstruct again, or if, like the one I saw before this, how could anything trickle around it. However, Mr. Wilkinson said he thought something of the kind must be the case, and as I held out no hope for her, decided to let her take her chances. I begged to be kept posted about her symptoms, etc., and on the sixteenth day, or September 15th, I dropped in to see how she was doing, not hearing anything more. I found another veterinary surgeon had been called to give an opinion, and diagnosed typhoid. However, while there she died, and a harder death I never saw. I think she must have taken at least fifteen minutes, and her struggles and countenance were distressing. This being on Sunday, and having on my Sunday best, I lost no time getting sufficient necessaries for the afternoon. The ball which I send you was lodged, as I said before, at the posterior extremity of the colon, and the largest groove or fissure was presented at the rectum, which allowed the fæces, when very soft, to trickle into the rectum. I felt pleased with the post-mortem.

[NOTE.—The hair-ball (*ægagropilus*) received measures twenty inches in circumference and weighed when removed from the animal three pounds and ten ounces.—EDITOR.]

CHRONIC GASTRITIS.*

By Dr. CHAS. J. POLLARD, Princeton, Ky.

Chronic gastritis is a condition of the stomach almost daily met with in this country in a more or less well developed form, and to successfully treat these cases as they come to us is a goal we all desire to reach.

This disease is almost invariably associated with more or less indigestion manifested by many protein symptoms and accompanied by more or less active vomiting of the ingested materials.

The gastric secretions are almost without exception abnormal, many fermentative changes taking place in stomach contents, thus necessitating lavage more or less frequently for its relief.

The report and treatment of the following case, while not strictly in accord with true homœopathic prescribing, perhaps, was so prompt in effect and has proven so lasting in results that I shall be willing to shoulder any censure that may be heaped upon me.

On May 21, 1900, Mr. H. came to me from an adjoining county and applied for treatment, having been through the hands of two old school physicians in the last four years.

His age, 57; average build, lean, languid, dull, expressionless eyes, coated tongue, dirty, sallow-colored skin; gave history of indigestion for last four years, characterized by eructations of sour materials, pain after eating, nervous depression, sleepless nights, constipation alternating with occasional attacks of diarrhoea, vomiting, not marked, loss of flesh, weak pulse, flabby muscles; in fact, a typical case of gastric catarrh in its chronic form.

From the history of treatment and the many symptoms pointing to the drug, I prescribed *nux vomica* and diluted muriatic acid after meals, believing the digestive fluids deficient in quantity. The patient reported some improvement in two weeks, his medicine was repeated, and he was cautioned about diet, as formerly.

He reported again on the 21st of June, 1900, and gave history of an attack of rheumatism one week before, but still improving slowly of his stomach trouble.

In the meantime I had been studying this case arduously; I read of a case having been successfully treated with hydrozone

* Read before the Meeting of Kentucky State Homœopathic Medical Society, May 29, 30, 1901.

and glycozone, then I concluded to use these as adjuvants when patient returned.

Owing to impossibility of regular lavage, I furnished patient with two ounces of hydrozone and directed him to add one ounce to a quart of sterilized water and take half a tumblerful half an hour before meals.

This, you will perceive, would procure a clean surface for the oncoming meal, though for the first few days it produced some discomfort, he said, from accumulation of gas.

Immediately after meals he was ordered to take a teaspoonful of glycozone in a wineglassful of water and three grains of *nux vomica*.

The next report was the 16th of July, when the improvement was very marked in his general appearance; patient was then able to eat without any dread of pain or discomfort.

Prescription was repeated, and by August 1st all signs of any lesion of stomach had disappeared. Patient claimed to be well for the first time in four and one-half years.

Treatment was discontinued, of course. I saw this patient recently and he had practically no trouble since last August.

Dr. Finlay Ellingwood, in his excellent "*Materia Medica*," says glycozone is one of the best manufactured products of the present time in its action upon enfeebled disordered stomachs, especially if there is ulceration or catarrhal gastritis.

It is a most efficient preparation and I shall use it freely in the future.

DEPARTMENT OF SURGERY.

BY L. A. AND E. MERILLAT,

Chicago Veterinary College, 2537-39 State Street, Chicago, Ill.

SURGERY OF THE EYE, EAR AND UPPER AIR PASSAGES.

(Continued.)

SUBCONJUNCTIVAL INJECTIONS have been in use for some time, and can by no means be considered anything new or novel; they have been employed in many instances by practitioners as a last resort, and to the surprise of all concerned have proven beneficial. It is a procedure, however, that should not be employed promiscuously and without aseptic precautions.

Before resorting to such treatment of ophthalmic diseases, we must consider its indication, and determine to a degree of certainty the practicability of such measures. Good results

have been obtained from the use of subconjunctival injections of normal salt solutions in the treatment of chronic inflammatory diseases of the coats of the eyeball; they give very satisfactory results in iritis, irido-eyelitis, corneitis or scleritis, although not indicated in the acute state; but, when the condition becomes chronic the injection of a physiological salt solution will often have a good effect upon the disease. The exact manner in which the good results are produced is not known to a certainty, but in our opinion the salt solution injected into the tissue stimulates the lymph spaces and lymph-channels, and in this way increases absorption of the oversupply of lymph in it. The presence of salt solution in tissues does not add anything to them in the way of nutrition, but the cells, intercellular substance and fibres of a tissue bathed by the solution are stimulated to activity, and in this manner allows them to perform their normal function.

The change following a subconjunctival injection might also be the result of prevented hypernutrition; that is, by reducing the amount of nutritious elements carried to the part involved, the lymphatics are enabled to remove foreign substances contained in the tissue in much less time than would be required otherwise, and in this way the pathological conditions soon would become less intense and the absorbing system allowed to perform its normal function. We therefore notice two ways by which we can account for the beneficial results following such injections, 1st, by increased activity of the lymphatics, and, 2d, by a reduction of nutrition carried to the part involved. To tell which of these two is correct is impossible, and, in fact, of but little importance; what is most valuable to us is the result, not the manner in which nature accomplishes its purpose.

Such injections should never be used in acute conditions, for in such instances the lymph-radicles are already over-stimulated or over-taxed by an increased amount of substances in the interstitial spaces of the tissue involved. The proper course to adopt in acute cases of this nature is to reduce or prevent the development of the inflammatory intensity by external applications; and, when this is accomplished, and the tissues that were involved remain abnormal by hypernutrition, or subnormal activity of the absorbing system, they may then be stimulated by these injections. Some of the indications for subconjunctival injections of *normal salt* and *antiseptic solution* are the following chronic conditions:

1. Scleritis.
2. Choroiditis.
3. Corneal ulcers.
4. Corneal opacity.
5. Iritis.
6. Cyclitis.
7. Irido-eyelitis.

1. SCLERITIS.—The indications for subconjunctival injections in diseases of the sclera are not very numerous; in fact they should not be employed unless the pathological condition encroaches upon the cornea, or when there is danger of a subsequent development of acute scleritis.

If in the infiltration of the sclera, the process is likely to extend to the cornea by passing through the sclero-corneal margin the lymphatic spaces and channels may be stimulated by physiological salt injections. The solution used for this purpose must be well sterilized and filtered. The needle is passed under the conjunctiva into the connective tissue that unites it to the sclera or the external layer of the sclera, near the sclero-corneal margin (2-3mm. from cornea), and 2-5 minims of the solution injected in each quadrant of the corneal periphery affected. These injections can be repeated every day or every other day, and continued until the lymphatics have regained their normal activity. The object of the injection is only to assist and excite the physiological function of the lymphatics, and when they are aroused to activity, the injections must be discontinued, in order to give nature an opportunity to remove the abnormal interstitial substance which produces the disturbance.

2. CHOROIDITIS.—Two forms of choroiditis are noticed, viz., (a) Exudative; and (b) Suppurative.

(a) *Exudative choroiditis* is not a common disease in domestic animals, but however is recognized occasionally in anæmic patients. The morbid anatomy of the condition is as follows: The vessels are engorged and surrounded by large cells; the spaces between them contain fibrin and hyalin; proliferation of pigment cells. The exudate may change the relation of some of the layers of the retina, and in the last stage the choroid becomes fibrous as a result of atrophy.

Diagnosis.—It is always very difficult to diagnose choroiditis, for in most cases the retina is involved, and it is generally very difficult to determine whether the exudate is from the choroid or retina, even when assisted by the ophthalmoscope. We must have a good history of the case, take into considera-

tion the constitutional condition of the patient and the condition of the sight. In cases of long standing the choroid coat is atrophied and the vitreous humor becomes opaque, but in the early stage we can detect nothing except enlarged blood-vessels with but a slightly impaired sight. The condition is more easily detected in human patients than in animals; slight visual defects are not easily detected in animals.

(b) *Suppurative choroiditis* is a condition, suppurative in nature, which sometimes extends to the ciliary body and iris. The cause of the condition is usually due to injuries, such as penetrating wounds, or ulcers of the cornea which extend inward (*metastatic choroiditis*.) The condition may also result from some focus of inflammation which may get some of its septic product into the circulation and cause a septic embolus, which will often produce a secondary infection (*endogenous infection*).

The *symptoms* are more alarming than those of the exudative form, and are not confined to the choroidal condition. The eyelids become swollen, the intraorbital tissues become infiltrated with septic products, which change them to such an extent that the eyeball can scarcely be moved. In this form of choroiditis the use of salt solution is not indicated, and it is useless to attempt anything but evisceration or enucleation. In the exudative form, however, subconjunctival injections have been used in human practice with very good results. The injection should extend a little deeper than when the sclera is involved. The quantity used is about the same as already mentioned. If there is any danger of the exudative condition becoming suppurative, bichloride of mercury solution may be employed instead of salt solution. The strength of the bichloride solution may vary from 1:2000 to 1:4000 or even less.

3. CORNEAL ULCERS AND CORNEITIS.—The course and termination of corneal ulcers have already been mentioned. *Suppurative keratitis* is always due to the presence of septic organisms, which are generally introduced from without; therefore, the injuries and wounds of the cornea must be promptly treated by disinfection with weak bichloride or formalin solutions. Aseptic solutions, such as sterilized water or normal salt solution, may be used to clean corneal injuries or wounds. Wounds in a normal cornea always heal very readily, if not infected; and for this reason, early attention is a precaution which will often prevent suppurative corneal complications.

The Treatment of these corneal conditions should be aseptic precaution, to prevent extension of disease; and antiseptic,

to enable the ulcers to heal ; when the condition involves the deeper structures and the activity of the lymphatics is dormant or sluggish, as in the asthenic form of keratitis, the use of subconjunctival injections of either antiseptic fluids or normal salt solution is indicated and should be administered in the same small doses as already mentioned.

4. IRITIS.—The origin of the cause of iritis may be local or constitutional. Among the most common causes of local injuries are penetrating wounds and foreign bodies in the cornea or ciliary zone ; to this we may add metastatic iritis from keratitis, scleritis, eyelitis or choroiditis. The constitutional causes are rheumatism, tuberculosis, epizootic influenza, pyæmia, and gonorrhœa. Rheumatism is a shield which veterinarians have used in making diagnoses when the cause is obscure ; and for this reason we do not like to give this as a cause of any disease. There is no doubt that domestic animals are susceptible to rheumatism, but when the practitioner shelters his diagnoses in the dark and "shady" nooks of such an obscure condition as rheumatism as the cause of iritis, lameness, endocarditis, etc., he often finds it a difficult task to convince other "up-to-date" and progressive veterinarians that his etiology and even his diagnosis are correct. *This cause (rheumatism) for unexplained conditions has been employed to such an extent that it has fallen into disrepute, and most invariably when the veterinarian says that rheumatism is the cause of any particular condition, the average driver, coachman or barn-boss will say: "Ah! he don't know what is the cause of the trouble—he said it was rheumatism."*

The most common causes of iritis in domestic animals are traumatism, and the common symptoms are sluggish pupil, congested conjunctiva, paralysis of ciliary muscles (*cycloplegia*), paralysis of sphincter of pupil which causes a dilatation of pupil (*corodiastasis*), and in cases of long standing the pupil may become closed (*corodisis*).

Treatment.—If the condition is due to some constitutional disorder that should be improved, but our entire attention should not be directed to that alone ; the condition of the eye must not be neglected and probably the most important part of the treatment is to prevent adhesions of the iris. The treatment must not be confined to subconjunctival injections ; the use of such injection in the course of treatment is only to prevent infection ; if there is any danger of infection, or to increase absorption, nothing more can be expected from the procedure, and the regular

treatment indicated in each case must be followed up carefully.

6. IRIDO-EYELITIS AND EYELITIS.—Both of these are generally only secondary conditions following iritis or choroiditis; some cases, however, are of a traumatic origin resulting from wounds or foreign bodies in the ciliary region. The use of sub-conjunctival injections in either of the above mentioned diseases is to increase absorption, and by accomplishing this the exudates which usually accompany the disease are lessened, and the danger of adhesions diminished; but the procedure, without other measures, is not sufficient to effect a cure.

SURGICAL ITEMS.

Domestic Animal Dentistry.—The practice of veterinary dentistry is so extremely distasteful to the college professor and better class of veterinary practitioners that the dental operations are usually consigned to the student, the assistant surgeon, the stableman, the horseshoer or the non-graduate veterinary dentist. The apathy and antipathy of the well-to-do practitioner and teacher of surgery toward the art of domestic animal dentistry dates from the earliest history of veterinary science and at this time, the beginning of the twentieth century, it may still be truthfully referred to as a neglected branch of veterinary surgery. The best and most elaborate text-books on veterinary surgery, foreign and domestic, cover the entire subject in a few pages, while the teacher of surgery in the various schools where strenuous efforts are made to augment the skill of students in other departments, frequently dismiss dentistry with only a brief mention of the more complicated operations allied thereto. A methodical effort to develop the skill and dexterity upon which successful dentistry so largely depends is seldom undertaken in our colleges, and is still less frequently acquired after graduation. In this, as in other departments of surgery, we are fostering an enthusiasm for difficult operations which bring only nominal results and entirely neglect simple, popular procedures which are almost universally satisfactory to our *clientèle*. The reason is obvious. Veterinary dentistry, especially horse dentistry, is laborious, difficult and even dangerous until a certain degree of skill has been attained, which facts are responsible for the inclination to slight the work or else willingly consign it to others as both undignified and unimportant. We have all seen our learned professors roll their sleeve to cope with a putrid fistula of the withers or a foetid uterus, but rarely have we seen them undertake to demonstrate the proper use of dental instruments.

This is not remarkable, as only a few years ago human dentistry was performed by the watchmaker, locksmith and the barber. The human surgeon of the seventies usually referred his patients suffering from an aching tooth to these mechanics, without even a thought that within one short generation the art of dentistry would develop into such an enviable and useful special profession. We do not predict that domestic animal dentistry will proportionately develop to the point of becoming a special profession, but we do predict that our *clientèle* will eventually, if they do not already, recognize that dental operations even of the simplest kind demand the keen judgment and skill of the trained veterinarian. Dentistry is the art of mechanically repairing or improving the mechanism of mastication, especially the teeth. Human dentistry owes its existence to a *bio-chemic disease* (caries), from which few mature individuals escape. The human dentist is thus engaged chiefly in combating and repairing the results of the diseased process, by cleansing and filling cavities with metallic substances and by supplying artificial organs when the natural ones are diseased beyond repair. It may be truthfully said that among the civilized races *all* mature subjects suffer more or less from this disease, which in the early history of dentistry was treated by ablation of the offending organ, but which, it has subsequently been shown, can be treated in such a manner as to make it serve its useful purpose indefinitely. In the domesticated mammals this same disease does not exist to any appreciable extent, if at all, but these animals, especially herbivora, suffer from a *physical defect* (lateral enamel projections) of equal frequency. No student of zoölogy will doubt that the domesticated herbivorous mammal suffers from frightful physical deformities which are eminently inimical to their general health and usefulness. The veterinarian is thus chiefly engaged in correcting these deformities by cutting and floating precisely and to the same extent as the human is engaged in filling the cavities of caries dentium or replacing the organ entirely. The other physical defects and diseases of teeth besides the *caries of human teeth* and the *lateral projections of herbivorous teeth*, though often of eminent importance, demand a very small share of the dentist's attention, because they are relatively rare. The porcine, ovine and even bovine species do not require the same regular attention as the domestic horse, on account of different occupation and their short life. It is only here and there that these genera are permitted to live beyond the period of maturity, except for breeding purposes, in which

case dental attention should be given them. In the canine and feline species the anatomical constitution of the dental organs precludes projecting deformities and the short life prevents caries, so here again the veterinarian meets only an occasional condition demanding attention. It is therefore evident that domestic animal dentistry naturally centres upon the horse, whose commercial value depends almost entirely upon his general health and utility, which is impossible without a normal mechanism of mastication. That mastication and insalivation are two of the most essential digestive processes in herbivora, and of more relative importance than in man, is apparent to all students of physiology and pathology. Coarse amylaceous food of herbivora requires perfect comminution and incorporation with the salivary secretions in order to assure perfect gastric digestion, while the artificially prepared, cooked and seasoned food of man may without serious detriment be passed directly to the stomach with but little mastication. The same may be said of the canine, feline and porcine genera, all of which consume their food without even a semblance of persistent mastication. Then, again, the mouths of these animals are used only for mastication, while in the horse it is utilized for driving. The manner in which a horse accepts the bit is a prime factor in his value. That dental irregularities that wound or even irritate the buccal surface is frequently the cause of making a miserable driver out of an otherwise complacent one is a matter of common observation. A horse that has a "poor mouth," as it is generally expressed, one that will not "go against" the bit, a "side-reiner," or one that protrudes the tongue or slobbers persistently, is frequently improved if not entirely cured by removing the defects which produce these conditions. The human dentist has three objects in view, namely: (1) *To relieve pain*; (2) *to improve mastication and general health*; and (3) *to preserve the features of the face*. The aims of veterinary dentistry are:—(1) *To improve mastication*, especially of the horse, and by removing either congenital or acquired abnormalities which wound the buccal surface, produce pain or prevent perfect apposition of the dental arches; (2) *to treat the secondary conditions* emanating from dental diseases and abnormalities; (3) *to correct driving defects of horses* produced by irregularities which wound or irritate the buccal surfaces; (4) *to improve the appearance of the incisor teeth* so as to make an apparent difference in the age of horses; (5) *to relieve pain* by extracting diseased teeth of all domestic animals; (6) *to remove tumors* of the jaws, teeth or nasal fossæ,

of the horse and ox ; (7) *to treat traumata of the jaws and buccal surfaces* from all causes ; and (8) *to correct faulty eruption* of the permanent and temporary dentures. A circumspect review of this brief summary will readily reveal the wide sphere of usefulness as well as the importance of veterinary dentistry, so forcibly as to leave no room for negative propositions.—(L. A. M.)

EXTRACTS FROM EXCHANGES.

GERMAN REVIEW.

By ADOLPH EICHHORN, D.V.S., Bureau of Animal Industry, Milwaukee, Wis.

SARCOMA IN A HORSE—DEATH FROM A SARCOMA OF THE CEREBRUM [Ebertz].—A mare, 16 years old, showed a tumor on the right side of the neck, in the region of the joint of the third and fourth cervical vertebræ. The growth was of the size of a chestnut, which on palpation proved to be smooth, solid, painless, and firmly grown to the surrounding tissue. The tumor for a long time has shown no tendency to grow, which period was followed by an inclination to an enlargement, so that a diagnosis of a "malignant tumor, probably a sarcoma," was established. Its extirpation was decided upon, and after overcoming considerable difficulties a tumor of the size of a double fist was removed. The new formation on histological examination proved to be a round-cell sarcoma of small cells, showing also the beginning of fatty degeneration. Although the operation wound appeared to take a normal course, a grave prognosis was given, considering the malignant tumor and their great tendency for metastatic formations. Three weeks after the operation the horse was suddenly attacked by dizziness and fell down, distorting the eyes, and remained quiet for a few minutes. After a short time the horse got up without assistance. This attack came on repeatedly at intervals of one to several days, on which a diagnosis of a sarcoma in the cranial cavity, probably in the cerebellum, was based. After a time these attacks of dizziness almost ceased ; on the other hand the animal developed a complete stiff gait in the hind legs, carrying the legs wide apart, and at this time at the place of operation a tumor of the size of a nut made its appearance. One day the horse suddenly died. Autopsy : A tumor-like degeneration of

the right kidney, weighing about 14 kilograms, destruction of the right ureter by the new formation, compensation hypertrophy of the left kidney, metastatic formations of the kidney tumor in the spleen, between this and the liver, and also around the rectum. In the great longitudinal fissure of the two hemispheres of the brain laid a humpy grayish red tumor of the size of an apple, which started from the plexus of the vessels, destroying this entirely; the brain substance surrounding the tumor showed an encephalo-malacia flava, the right lateral ventricle is vanished, while the left is dilated to a considerable extent, the convolutions flattened and the brain substance moist; the heart was greatly hypertrophied. The diagnosis of a round-cell sarcoma was confirmed by the pathological institution of Berlin. The sarcoma of the kidney must be considered as the primary growth, and for this speaks the size of the growth, the manner of spreading from this, the strong compensation hypertrophy of the left kidney, the great hypertrophy of the heart, which is the consequence of a diseased condition of kidneys of long standing. It is very peculiar that in spite of the severe alterations of the brain, the horse manifested very slight symptoms to indicate the cerebral changes.—(*Ztschr. f. Veterinärkunde.*)

FILARIA PAPILLOSA IN THE ANTERIOR CHAMBER OF THE EYE [*A. Vethy*].—In the anterior eye chamber of a horse, which showed some photophobia, lachrymation and diffused cloudiness of the cornea, a 7 cm. long filaria was noticeable. After a foregoing antiphlogistic treatment the filaria was removed in the following way from the cast horse: After a careful cleansing and disinfection with a 3 per cent. boracic acid solution, atropin was dropped into the eye and the cornea anæsthetized with cocaine, then the eyelids were kept apart with the aid of Desmarre's spoons, the bulbus fixed with a Weber's pincette, and, after an incision was made in the cornea about 3 mm. from the corneal border, the parasite was removed with an iris pincette. Complete recovery followed in 14 days, with the use of a compressive bandage.—(*Veterinarius.*)

ANTHRAX WITH A DIMINISHING IN SIZE OF THE SPLEEN [*T. Hajnal*].—A cow, which suddenly died, showed, besides tubercular lesions, a tarry condition of the blood and hæmorrhages in the subcutaneous connective tissue. The spleen was markedly diminished in size, its capsule wrinkled, and on section the pulpa proved to be soft, almost liquid. The microscopic examination of the blood revealed anthrax bacilli.—(*Veterinarius.*)

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THE TREATMENT OF PURPURA HÆMORRHAGICA (ANASARCA, PETECHIAL FEVER) [*Mainet*].—With the exception of primary purpura hæmorrhagica, which is very rare, this ailment always has a microbial, not specific cause, of which the effects are due to a conversion of vasadilatoric toxins into the circulatory apparatus. In the course of treatment it is essential to destroy the germs, to neutralize their secretory products or to annihilate them and to encounter the dilatation of the capillary vessels. The treatment therefore aims at general and local antiseptics and a contraction of the vessels. The medicines can be applied by os, by subcutaneous, tracheal, or intravenous injections; also good results can be obtained by serotherapy. Saline purgatives and diuretics will eliminate the toxic principles, purifying the blood and prevent hæmorrhages, as the ammonia salts, potassium nitrate, alcohol, coffee, turpentine. Further antiseptics, as creolin, creosote, boracic acid, naphthalin, one-half per cent. carbolic acid solution, natr. salicyl., salol., etc. Subcutaneously can be applied 200 gm. of a 1 per cent. salicyl. acid solution, or a solution of 1 part iodine, 2 parts iodide of potass. and 100 parts distilled water. The last solution, also carbolic acid, creosote and thymol preparate, were also applied by intratracheal injections, but this method is not recommended, as pneumonia may result from the foreign body, with its bad consequences. The intravenous treatment is to be used with the greatest care; by this way the argentum colloïdale Crédé can be injected in a dose of 0.50:50 gm. of water; also Cheron's serum, of which the formula is: natrium sulph., 8 gm., natrium phosph., 4 gm., natr. hydrochlor., 2 gm., aqua distill., 200 gm., acid. carb. pur., 1 gm. The serotherapy can be practiced with natural or artificial serum, normal serum of the horse, daily 100 gm.; still better, Marmorek's or Deny's antistreptococcic serum in doses of 30 cm. 3 daily for 3 to 4 days. As artificial serum a 7.1000 solution of natr. hydrochloric, can be used or Menveur's serum (natr. hydrochl., 5 gm., natr. phosph., 1 gm., natr. carbon, 1 gm., caffein hydrochlor., 10 gm., and filtrated boiled water 100 gm.) three times a day. The local antiseptics consists of opening the abscesses, nasal injections of antiseptics, inhalations of antiseptic fumes, etc. High fever requires antifebrin, antipyrin, quinine, etc. The symptomatic treatment consists of cold douches to the head, rubbing of the œdema with tinct. of cantharides, oil of turpentine, scarifications, etc.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

BILIARY OBSTRUCTION CAUSED BY A PARASITE [*A. Marston*].—The author was requested to examine a pig which was suspected of swine fever, but failing to discover any indication of the disease, the animal was slaughtered. At the post-mortem which was made all the internal organs were found healthy except the liver. The gall-bladder was found of very large size, about three times larger than normal, and was filled with fluid; on the inside was found a worm, three inches in length, about the size of a lead pencil. It completely closed the biliary duct. —(*Vet. Record.*) [This worm belonged probably to the *ascaris megalcephala*.—(*A. L.*)]

LACTATION IN A FOAL [*E. P. Smith*].—Cases of early lactation in young females are not rare, but the one reported by the author is more surprising than any on record. It is that of a foal, one day old, which had congestion of its mammary glands. These were well rubbed and soon milk began to flow freely—a pint of it was obtained the first time. The animal was milked for several days in succession and after ten or twelve days dried. The foal remained all the time in good health, but on the ninth day she was strongly in season, as her dam herself was. —(*Vet. Record.*)

FOREIGN BODY IN THE STOMACH OF A DOG [*A. S. Hodgkins*].—Foreign substances often occasion trouble in dogs, and their nature varies considerably. The following case is, however, unusual: A five-year-old Yorkshire terrier became sick. The nose was moist; eyes bright; he was lively, but emaciated; he had a constant irritating cough. Placed under tonic treatment, good food and so forth, he went on for a few days, when one morning he began to scream as in great pain. Having some constipation he was given two aperient pills and placed in a clean kennel, where he remained looking very sickly, drowsy and screaming now and then. Four hours after he had taken the pills he was taken with vomiting, and on examination of the thrown-up mass it was found containing a piece of lead pipe, $\frac{3}{8}$ in. thick, 2 inches long and weighing $1\frac{1}{2}$ ounce. The screaming stopped suddenly, the dog took a drink of warm milk, the bowels acted freely and the next day was sent home cured. It seems that there had been plumbers about the house

where he was, thus explaining the origin of all the trouble.—
(*Vet. Record.*)

THREE CASES OF ŒSOPHAGOTOMY IN DOGS AND CATS [G. Mayall].—*Case 1.*—A fox terrier dog is suspected to have a bone in his throat, as he has great dribbling of saliva and makes frequent efforts to swallow. Nothing was found in the mouth, or pharynx, but on feeling along the neck, a hard substance is felt along the œsophagus, half way between the pharynx and the entrance of the chest. With permission of the owner the dog was operated. "On cutting through the skin, the jugular was exposed and pushed aside, when by the pressure on the opposite side of the throat the spike of a piece of bone was brought into view." Leaving the œsophagus in place as much as possible, it was incised and a triangular piece of bone removed, measuring two inches in length. It seems as a splinter off the shaft of a leg of mutton bone. The œsophagus was sutured with catgut and the external wound with silk. In two weeks the dog was discharged cured. *Case 2.*—A cat was supposed to have a fish bone in the throat. The position of the foreign body being made out by the cat wincing and evincing pain on pressure, the animal was chloroformed and an incision made on the spot where the bone was. There was a great deal of hæmorrhage. The bone broke while being grasped and only half of it was removed, the other being swallowed by the cat. The œsophagus only was sutured, the external wound left open. The animal was kept for a while on liquid food and made a perfect recovery. *Case 3.*—In this case no interference on the œsophagus was necessary as the foreign body made its appearance through the abdominal walls, whence it was pulled out.—(*Journ. of Comp. Pathol. and Therapeutics.*)

ANEURISM IN THE DOG [C. A. Powell].—A great dane, seven months old, was attended by the author for an attack of mange, from which he recovered. He also had tape-worms. Some six weeks later he was in very satisfactory condition, but began to fall away in condition. The visible mucous membranes were very pale, the temperature normal, the pulse regular but weak. General tonic treatment was prescribed, but no benefit was derived from it. He then grew rapidly worse, refused all food, and showed pain on pressure over the region of the left kidney; on that spot a swelling was detected. The dog died after a few days. At the post-mortem there was found an aneurism of the posterior aorta, close to the left kidney. It was as large as the two closed fists and had ruptured, leaving a quan-

tity of blood in the abdomen. There was a second aneurism, as big as a small orange, in the chest at the bifurcation of the anterior aorta. The heart was smaller than normal, with flabby walls. All the organs were healthy.—(*Journ. Comp. Pathol. and Therapeutics.*)

AN INTERESTING CRANIAL CASE [*W. Bower and F. Hobday*].—A hackney filly, supposed to have been hurt while at pasture, had a purulent discharge issuing from a hole situated in the forehead, apparently either in the upper part of the right frontal or at its junction with the parietal. As all antiseptic treatment had failed to relieve her, it was decided to operate. Cocaine was injected and the "skull trephined at the upper extremity of the frontal sinus, as high up as it seemed safe to go, and just below the injury, the idea being to work from below." But this could not be done, being arrested by the septum which forms the roof of the sinus. It was necessary to enlarge the hole in the cranium with bone forceps, and when it was sufficiently large to admit a finger with a great deal of care a piece of bone about the size of a shilling piece was removed. It had laid over the brain, leaving the membranes intact. Recovery followed with antiseptic treatment of the wound.—(*Journ. Comp. Pathol. and Therapeutics.*)

BIBLIOGRAPHY.

VETERINARY MATERIA MEDICA AND THERAPEUTICS. By Kenelm Winslow, B. A. S., M.D.V., M.D. (Harv.), Assistant Professor of Therapeutics in the Veterinary School of Harvard University, etc. New York: W. R. Jenkins, Veterinary Publisher, 851-853 Sixth Avenue.

The field of veterinary materia medica has never been filled to the extent that the importance of the subject demanded, and, while all other branches of veterinary science have had numerous contributions from American authors that of medicine and therapeutics has never received the compliment of a presumptuous text-book, veterinary posology being about the extent of the efforts put forth. The excellent work by Finlay Dun has been our only guide, and it would be a rather reckless assertion to claim that this treatise was well adapted to the needs of the present generation of American veterinarians. In England, it may be a satisfying compendium of therapeutics, but in the live, bustling up-to-date profession of the Western Hemisphere, it is many years to the rear, and the time is well at hand when we should have text-books adapted to American methods and

conditions. Notwithstanding the fact that the reviewer of the *Veterinary Journal* (England) finds so much fault with the work of Prof. Winslow, it is destined to supersede Dun's "Veterinary Medicines" in all English-speaking schools where prejudice is not the controlling factor, as seems to be the case with everything veterinary which bears the American stamp in the eyes of our London contemporary.

The work under consideration is systematically arranged, beginning with a chapter upon "Preliminary Considerations," which include definitions, mode of action of drugs, absorption of drugs, and their elimination. Then the "Circumstances Modifying the Actions of Drugs," such as the mode of administration, dosage, anatomy and physiology, time of administration, habit, disease, and idiosyncrasy. Following this comes a consideration of the "General Actions of Drugs," with special reference to those acting on the digestive organs, the circulation, the nervous system, the respiratory organs, the urinary and sexual apparatuses, those influencing metabolism, bodily heat, and those acting on the skin. The chapter on "Pharmacy" deals with the more important medicinal bodies and principles contained in drugs, pharmaceutical processes and preparations; official preparations, classifying them according to their solvents and their modes of preparation. "Incompatibility" is treated of in three pages, while "Prescription Writing" is most thoroughly discussed. In the "Classification" the general division of "inorganic agents" and "vegetable drugs" is made, and then the subject of materia medica proper occupies the body of the work, and we are quite safe in saying that, although there may be many errors of omission, there are few of commission in the conservative estimate of the work of Dr. Winslow. Not content with arranging his subject under comprehensive section headings, he makes his work more complete as a reference-book by presenting a chapter upon "Doses of Drugs" for all domestic animals, and then takes up the subject of "General Therapeutic Measures," discussing food and feeding, counter-irritants, cold and heat, disinfectants, antiseptics, and deodorants, venesection, transfusion, saline infusion, hypodermoclysis, and enteroclysis, closing his work by a most complete "Index of Diseases and Remedial Measures," and a "General Index."

Already the text-book of Dr. Winslow has been adopted in many of the colleges of this country, and it is safe to predict that it will receive the endorsement of practitioners wherever it is introduced.

Jenkins has made the volume worthy of its valuable contents by presenting it in handsome style, the typography, paper and binding being excellent.

R. R. B.

OUTLINE OF THE CLINICAL DIAGNOSTIC OF THE INTERNAL DISEASES OF DOMESTIC ANIMALS. By Prof. Dr. Bernard Malkmus, in charge of the Equine Hospital of the Royal Veterinary College of Hanover, Germany. Translated by Profs. D. S. White and Paul Fischer, of the Ohio State University, College of Veterinary Medicine. Chicago: Alex. Eger, 34 East Van Buren St.

We are pleased to note by the appearance of this neat little volume that Mr. Eger is keeping up the task which he imposed upon himself a couple of years ago of giving to the veterinary profession translations of some of the best recent productions of foreign authors bearing upon the important specialties in veterinary science. While he has already published a number of works, including "Meat Inspection," "Milk Inspection," etc., none have appealed so strongly to the practitioner as the present volume, for surely no subject is of greater practical importance than that of clinical diagnostics; indeed, many claim that the true science resides in this step, therapy being a simple matter when once the indications have become established by a correct diagnosis. The veterinarian having to rely upon the subjective symptoms in a patient which cannot speak, diagnosis is just so much more difficult than in the human patient. Therefore, any aid that can be brought to him from an authoritative source should be hailed with delight. The great opportunities and brilliant achievements of Prof. Malkmus in this field have made for him an international reputation as a diagnostician, and we are greatly indebted to his translators, Profs. White and Fischer, who are eminently qualified for the work.

The volume consists of 200 pages, with numerous illustrations, many being in colors, some of which are excellent, that depicting a horse suffering from azoturia being very accurate.

We advise every practicing veterinarian to have a copy of Malkmus in easy reaching distance in his office library, and to study it over and over again, for there are many very thoughtful and valuable facts given in a very concise manner.

R. R. B.

BUREAU OF ANIMAL INDUSTRY: CENTURY SOUVENIR BOOK—1884-1900.

Through the courtesy of the compiler and publisher, Dr. D. E. Salmon, Chief of the Bureau, we have received the handsome souvenir volume which bears the above title. At the close of the nineteenth century, the "father" of this magnificent branch of the Department of Agriculture, which has

achieved such glorious results for the live-stock industry of this country and the cause of veterinary science, and whose splendid career cannot be equalled by that of any body of investigators in the world's history, conceived the idea of placing in compact form the story of its accomplishments, together with a sketch of those who have made these results possible. So he undertook the compilation of the volume under review, and he may well send it forth with pride, for it is a most complete and comprehensive work, and is but a just tribute to his army of faithful and devoted workers. It gives a concise history of the Bureau, the objects of its establishment, and the gradual widening of its sphere, all working in one way or another to stop the losses and to increase the receipts of the stock-raisers of the United States. Following the historical sketch there are 568 photo-engravings of the officers and employés, and in the second section a short biographical sketch of each individual in the employ of the Bureau at the close of the century. The frontispiece is a reproduction of the well-known picture of the President and Cabinet, followed by excellent full-page pictures of President McKinley, Secretary Wilson, Chief Salmon, and other dignitaries connected with the work.

We congratulate the compiler on the completeness of the task which he has accomplished and the excellent manner in which his artisans have fulfilled their contracts. R. R. B.

MERCK'S 1901 MANUAL OF THE MATERIA MEDICA: A ready-reference pocket book for the practicing physician and surgeon. Merck & Co., New York and Chicago.

This comprehensive compilation has come to be regarded by those for whose benefit it is regularly published as almost an indispensable companion, for while the text-book in the library goes into the subject with greater detail, the *Manual* deduces into small compass the most potent facts concerning the most modern and useful of the drugs and combinations, besides including the very newest preparations, many of which are not found in the text-books at all. For instance, the present number contains all the important new remedies of the past year. A new feature is introduced in this number by including the solubilities and incompatibilities of the various drugs and chemicals, while a formulary of well-selected prescriptions, gleaned from all reliable sources, has taken the place of the "therapeutic indications" of former editions, the prescriptions being arranged in accordance with the conditions which indicate their uses, thus enabling the reader to perceive at a glance the

purpose each is intended to serve. Part IV is an entirely new department, full of useful information, much of which is contained under the heading of "Poisons and their Treatment." Valuable tables are also here to be found, and altogether the *Manual* for 1901 is a much improved and very useful edition. While intended particularly for practitioners of human medicine, it is a useful guide to the canine prescriber, and will suggest many new combinations for the equine patient. R. R. B.

CORRESPONDENCE.

M'KILLIP'S OPERATION FOR TRACHEOTOMY.

NEW YORK CITY, Oct. 8, 1901.

Editors American Veterinary Review:

DEAR SIRs:—In your complete and also interesting issue of September there appears in the "Original Articles" from the pen of Secretary John J. Millar, V. S., a few lines headed: "Tracheotomy—McKillip's New Method," where it is stated that we (the authors) have been frequently requested to give *our* methods adopted in the operation of tracheotomy; and, further on, "that it has in view the overcoming of the many? (interrogation is mine) complications and unsatisfactory!! (exclamations also mine) results which accompany or follow the operation, that a *new* method seemed inevitable."

For the benefit of your readers, and to put everything in its proper place, by giving to Cæsar what belongs to him, I beg to refer parties interested to the fact that the new mode of operation is described in Peuch and Toussaint (2d edition), published in 1887; that Zundel, in the 3d volume of his dictionary, describes it in 1877, ten years before; that an English veterinarian, Gowing, in 1849 or 1850, invented a special tube for same operation; that Bouley described it *fifty* years ago, in 1851; that in the 3d vol. of "Operative Surgery," of Brogneir, published in Belgium in 1845, tracheotomy by section of the ligament between the cartilaginous rings, is mentioned; and, finally, that in 1775, Lafosse described the whole process as his invention, a fact which has been acknowledged by all those who have written on the subject since.

Is it now a question of priority between Lafosse and McKillip, or is it that the new method of McKillip is already 126 years old? Yours truly,

W. J. COATES.

CASTRATION BY LIGATURE.

BELMONT, MAN., October 17, 1901.

Editors American Veterinary Review:

DEAR SIR:—Being a recent subscriber to your valuable journal, the REVIEW, I noticed in the last number, that of October, a communication in the "Italian Review," by E. Bastianini on castration by elastic ligature, about which I should very much like to get further information. The questions I should like to ask are whether this method of castration has been tried on this continent or not, and whether, if it has been tried, has it proved a success. Also, where may the elastic ligature specially made for the purpose, I suppose, be obtained, and is this method of castration as successful on older horses as on young colts? Trusting if you are able to give me the desired information, I am not asking too much, I am yours truly,

WALTER HURT.

[NOTE.—The article referred to was abstracted from an Italian professional journal, and we can throw no further light upon the subject. A letter addressed to the author in care of Prof. Liantard, 14 Avenue de l'Opera, Paris, France, will be forwarded to the journal from which it was taken and thus probably reach the author.—R. R. B.]

SOCIETY MEETINGS.

MISSOURI VALLEY VETERINARY MEDICAL ASSOCIATION.

This association held its 28th regular meeting in the lecture hall of the Kansas City Veterinary College, May 25, 1901.

Dr. Tait Butler presented a paper on "Some Diseases of Animals Produced by Feeding on Corn and Cornstalks," which was well discussed by Drs. A. T. Peters and R. C. Moore.

Dr. A. T. Peters presented a paper entitled "Control of Hog Cholera by Preventive Vaccination," which was discussed by Drs. S. Stewart and W. R. Cooper.

Dr. B. F. Kaupp presented a paper entitled "Tubercular Invasion in Swine,"* which was discussed by Drs. Stewart and Peters.

At the business session, Drs. Tait Butler, A. W. Swedberg, C. B. McClelland, R. H. Carswell, F. F. Brown, and D. G. Moberly became members.

* Published elsewhere in this number of the REVIEW.

The following officers were elected for the ensuing year : President—Dr. A. T. Peters, Lincoln, Neb.; First Vice-President—Dr. L. D. Brown; Second Vice-President—Dr. C. B. McClelland; Secretary-Treasurer—Dr. W. R. Cooper, Kansas City, B. A. I.; Censors—Drs. Tait Butler, F. F. Brown, B. F. Kaupp, A. W. Swedberg, and John Forbes.

The following veterinarians were present : S. Stewart, R. C. Moore, B. F. Kaupp, W. R. Cooper, A. Long, E. Lee, E. J. Netherton, J. L. Otterman, A. T. Peters, L. D. Brown, R. H. Carswell, J. D. Cooper, A. Trickett, Robert Jay, R. H. Thomas, S. H. Caldwell, C. A. McCall, A. W. Swedberg, Tait Butler, Jos. Keane, T. A. Scott, H. H. George, D. G. Moberly, W. N. Niel, J. S. Grove, F. F. Brown, C. B. McClelland and A. C. Hart. Several veterinary students also attended.

The association adjourned to meet Oct. 24, 1901, at Kansas City.
W. R. COOPER, D.V.M., *Sec'y-Treasurer*.

MAINE VETERINARY MEDICAL ASSOCIATION.

The meeting was called to order at Hotel De Witt, Lewiston, at 7.30 P. M., Oct. 9th, by President Dr. A. Joly. At roll-call there were present Drs. A. Joly, I. L. Salley, W. L. West, C. L. Blakely, W. E. Fairbanks, J. H. Goddard and F. E. Freeman. The minutes of last meeting were read and approved.

The clinic held at Bar Harbor in July was reported by Dr. Salley.

Dr. F. W. White, of Caribou, was elected to membership.

Different cases were reported by members present and discussed.

Voted to hold next meeting at Augusta in January.

Adjourned at 10.30 P. M. F. E. FREEMAN, *Secretary*.

THE CHICAGO VETERINARY ASSOCIATION

held its annual election of officers on October 14, with the following selection of officers for the coming year :

President—Dr. H. W. Hawley.

Secretary—Dr. E. Merillat.

First Vice-President—Dr. C. A. White.

Second Vice-President—Dr. A. E. Rishel.

Third Vice-President—Frank Allen.

The association met at the Chicago Veterinary College with a large percentage of its members present.

ALLEGHENY COUNTY VETERINARY MEDICAL ASSOCIATION.

A number of Pittsburgh and Allegheny veterinarians held an informal meeting at Hotel Schenley on the evening of Aug. 22d, 1901, and, after much deliberation, perfected arrangements for the organization of a local association, which was completed at the same place on the evening of Sept. 13th, and the following officers duly elected:

President—Dr. J. Stewart Lacock.

Vice-President—Dr. N. Rectenwald.

Treasurer—Dr. Chas. W. Boyd.

Secretary—Dr. Jas. A. Waugh.

Board of Directors—Drs. B. F. Bachman, D. C. Gearhart, J. C. McNeil, H. S. Richards and J. E. Spindler.

Charter members—J. Stewart Lacock, H. S. Richards, J. E. Spindler, J. C. McNeil, N. Rectenwaldt, J. C. Kinghan, H. N. Mayer, B. F. Bachman, Chas. W. Boyd, Jas. A. Waugh, David Martin, D. C. Gearhart, G. B. Gilmor, F. Taylor, Geo. H. Dunn, H. Emery.

There was general discussion of existing conditions, and plans formulated for future work. Constitution and by-laws were adopted.

The first regular monthly meeting was held Oct. 2d, 1901, at the office of Dr. J. E. Spindler. Dr. A. W. Hinman, of Brad-dock, and Dr. John Spohn, of Homestead, were elected regular members, and Dr. F. W. Ainsworth and Dr. Benj. Howes, of Bureau of Animal Industry, were elected honorary members. These meetings have been favored with a large attendance; much sociability and great interest in the welfare of the profession.

JAMES A. WAUGH, *Secretary*.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

President Winchester has appointed the following

RESIDENT STATE SECRETARIES:

Alabama, L. Van Es, Mobile; *Arizona*, J. C. Norton, Phoenix; *Arkansas*, R. R. Dinwiddie, Fayetteville; *British Columbia*, Johnson Gibbins, 623 Granville St., Vancouver; *California*, Fred E. Pierce, 1724 Webster St., Oakland; *Colorado*, Charles Greswell, 211 Whitney Bldg., Denver; *Connecticut*, R. P. Lyman, 369 Allyn St., Hartford; *Cuba and Porto Rico*, C. D. McMurdo, 10th U. S. Cavalry, Manzanilla; *Delaware*, H. P. Eves, 507 West 9th St., Wilmington; *District of Columbia*, A

M. Farrington, 1436 Chapin St., Washington; *Florida*, J. G. Hill, 324 Forsythe St., Jacksonville; *Georgia*, N. P. Hinkley, Atlanta; *Hawaiian Islands*, W. T. Monsarrat, Honolulu; *Illinois*, E. M. Nighbert, Pittsfield; *Indiana*, J. R. Mitchell, Evansville; *Iowa*, J. I. Gibson, Denison; *Kansas*, N. S. Mayo, Manhattan; *Kentucky*, J. W. Jamieson, Paris; *Louisiana*, E. Pegram Flower, Baton Rouge; *Manitoba*, W. J. Hinman, Winnipeg; *Maryland*, L. A. Nolan, cor. Dillon and Fifth Sts., Baltimore; *Massachusetts*, Benj. D. Pierce, 27 Sanford St., Springfield; *Michigan*, G. W. Dunphy, Quincy; *Minnesota*, J. S. Butler, 40 7th St., Minneapolis; *Mississippi*, J. C. Robert, Agricultural College; *Missouri*, W. F. Heyde, 1215 South Jefferson St., St. Louis; *Montana*, Stewart W. McClure, Helena, Mont.; *Nebraska*, J. D. Sprague, David City; *New Hampshire*, Lemuel Pope, Jr., 101 State St., Portsmouth; *New Jersey*, J. Payne Lowe, 185 Jefferson St., Passaic; *New York*, Wm. Henry Kelly, 233 Western Ave., Albany; *North Carolina*, A. S. Wheeler, Biltmore; *North Dakota*, T. H. Hinebauch, Tower City; *Nova Scotia*, Wm. Jakeman, Halifax; *Ohio*, F. E. Anderson, Findlay; *Ontario*, John W. Groves, Hamilton; *Oregon*, Wm. McLean, 328 Fourth St., Portland; *Pennsylvania*, C. J. Marshall, 2004 Pine St., Philadelphia; *Quebec*, Chas. H. Higgins, 6 Union Ave., Montreal; *Rhode Island*, Thos. E. Robinson, 65 Main St., Westerly; *South Carolina*, Benj. McInnes, Charleston; *Tennessee*, Geo. R. White, 316 N. Front St., Nashville; *Texas*, M. Francis, College Station; *Virginia*, E. P. Niles, Blacksburg; *Washington*, S. B. Nelson, Pullman; *West Virginia*, L. M. Reefer, 1406 Chapline St., Wheeling; *Wisconsin*, R. H. Harrison, 83 14th St., Milwaukee.

NEWS AND ITEMS.

DR. W. H. DALRYMPLE, of Baton Rouge, La., was elected President of the Association of Experiment Station Veterinarians at its late meeting in Atlantic City.

DR. W. H. PENDRY, of Brooklyn, N. Y., has been nominated for the Assembly from his district by the Republicans, and we hope to chronicle his election in the next issue of the REVIEW.

DRS. GEORGE H. BERNIS, E. B. Ackerman, George J. Goubeaud, and Roscoe R. Bell are arranging to take a course in bacteriology at the Hoagland laboratory, Brooklyn, N. Y., this winter.

DR. J. F. DE VINE, of Rhinebeck, N. Y., has removed and located at Goshen, N. Y., where there seems to be a good opening for a practical veterinarian.

DR. GEORGE WEISBROD, of Brooklyn, N. Y., had under his observation in October a furious case of rabies in a horse, due to the bite of a dog suffering from that disease five weeks previously.

DR. MOSES ISAAC, of New Haven, Conn., for several years past with Dr. J. H. Kelly at his Olive Street hospital, in that city, has resigned his position and sailed for South Africa in charge of a load of horses and mules for the British government. He expects to be absent six months.

"THE COMPARATIVE DIGESTIBILITY OF RAW, PASTEURIZED, AND COOKED MILK," is the subject of Bulletin No. 77 of the Maryland "Agricultural Experiment Station, by Chas. F. Doane, in charge of the department of dairy husbandry and bacteriology, and T. M. Price, assistant chemist.

THE AMERICAN ASSOCIATION OF FARMERS' INSTITUTE WORKERS held its sixth annual meeting at Buffalo, N. Y., Sept. 18 and 19, when many interesting and valuable papers pertaining to the welfare of the association were presented and discussed.

EXAMINATIONS FOR MEAT INSPECTORS by the U. S. Civil Service Commission for positions in the Bureau of Animal Industry were held at various points throughout the country on Oct. 22. Any veterinarian who passed the examination will receive appointment, as difficulty is being experienced in securing enough eligibles.

REPORTS reach us that the horse operated upon at the clinic of the Wisconsin State V. M. Association by Dr. Adolph Eichhorn of Milwaukee (double neurectomy for the cure of spavin lameness) was quite successful. The horse had been lame for two years from a large spavin, and since the operation has been doing hard work and going sound.

IN ST. LOUIS, MO., the Board of Health distributed diphtheria anti-toxine made from a horse which subsequently died of tetanus. On Oct. 31, four children which were inoculated with the diphtheria serum had died of lockjaw and others were sick. The Health Department at once began to inoculate those who had received the poisoned serum with antitetanine.

THE CHICAGO HORSE SHOW ASSOCIATION has conferred upon Dr. M. H. McKillip the honor of Chief Veterinary Inspector at the show to be held in November. The large num-

ber of entries and the wide distribution of competitors assures the association of success. Dr. Gerald E. Griffin, U. S. A., and Dr. Orion E. Dyson, of Chicago, have been selected to act as assistants.

THE opening exercises of the Chicago Veterinary College were held at the college auditorium, October 2d, in the presence of the entire faculty, consisting of eleven veterinarians and two M. D.'s. Dr. E. L. Quitman delivered the address to the classes collectively. The number of students registered at the close of the first week was 146, which is the largest attendance since 1893, when the institution changed its course from a two to a three-year course.

DR. W. A. KNIGHT, of Houston, Texas, was on September 3d appointed acting State Veterinarian of Texas, vice Dr. Wm. Folsetter resigned. Dr. F. had been an efficient officer, and had the confidence of the State Live Stock Sanitary Commission, but the duties had become burdensome for his advanced years. Dr. Knight is a native of Ohio, a graduate of the Chicago Veterinary College, class of '91, and a post-graduate of the Kansas City College of '99.

DR. FRANCIS ABELE, JR., of Quincy, Mass., writes: "Three years ago I brought home from the New York meeting an apparatus for the Schmidt treatment. The first animal to use it was a valuable Jersey. She recovered. Last year she had the same treatment, and yesterday for the third time she has yielded to this treatment. Another cow that had the same treatment the first night and did not come to for about a week, has had two abortive attacks since. Shall try next year to milk through calving."

DESERVED RECOGNITION.—In commenting upon the election of Dr. W. H. Dalrymple to the Vice-Presidency of the A. V. M. A., the *Southern Farmer*, New Orleans, La., pays a high compliment to that sterling veterinarian, saying: "Dr. Dalrymple's long and distinguished services in Louisiana place him in the front ranks of teachers and practitioners of modern veterinary science, and his numerous friends in this State are glad to see that his great work is becoming generally appreciated throughout the whole country."

TANNOFORM.—An interesting report concerning the value of tannoform has recently been made by M. H. Hayes, F. R. C. V. S., Yewtree House, Crick, Rugby. Dr. Hayes says: "I used tannoform with 238 government mounts, of which I was in veterinary charge on board H. M. T., No. 38, *Idaho*,

going to South Africa, and found it an excellent antiseptic. The fact of its being soluble in spirit is a great point in its favor." Other features of special note, particularly in the external use of tannoform, are that it is odorless, and is twice as bulky as iodoform. Reports from numerous American veterinarians indicate that tannoform is also a most excellent remedy against the diarrhoea of cattle and in infectious intestinal catarrhs of horses.

SAVING CONVENTION TIME.—On the second day of the late New York State meeting the hour for adjournment for luncheon had arrived, the hotel was a mile distant, the literary programme was full to overflowing. A vote was taken on the question of "lunch" or "no lunch," when the members unanimously decided that they preferred intellectual rather than vegetative food, and at once proceeded with the reading and discussion of papers. But the hospitable Ithacans would not permit their guests to undergo the pangs of hunger in their pursuit of knowledge. Dr. Moore arose to the occasion and sent forth an order for two or three hundred sandwiches, and in less than an hour each member had his ears open and his mouth full. Many remarked that it was the most enjoyable luncheon they had partaken of in many a day.

TRANSMISSION OF DISEASE FROM ANIMALS TO MAN.—In the *New York Medical Journal*, Meany discusses the infection of the human being by animals. Anthrax and glanders have long been known to be thus transmitted. Scarletina, diphtheria and typhoid fever have been traced to cow's milk. Turner found a typical croupous membrane in the trachea of a pigeon. An epidemic of diphtheria followed a fatal affection of chickens. Diphtheria has been contracted by cats and spread by them to other cats and thence to their child owners. Swine, sheep, horses, cattle and dogs have been found suffering from a disease exactly similar to human diphtheria. Mason attributed an outbreak of malignant plague to a cat, which boarded a steamer at an infected port, showed signs of illness; and the eight sailors who died all occupied the part of the ship frequented by the cat. It is a pity sick animals cannot promptly be placed under the care of a competent veterinarian, now that these practitioners are to be found as thoroughly versed in the ways of modern science as the graduate of a medical college. At any rate, children should not be permitted to handle or attend sick pets, and every disease of domestic animals should be viewed with suspicion unless positively known to be harmless.—(*Alk. Clinic.*)

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